PUBLIC WORKS DEPARTMENT
MADRAS PRESIDENCY

ADMINISTRATION REPORT

FOR THE YEAR 1948-49

PART II-A—IRRIGATION

(REPORT)

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NOTE.—Part II-B. Irrigation (Statistical Statements) will be printed separately.

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ADMINISTRATION REPORT

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PART II-A—IRRIGATION

Chapter I.

PERSONNEL.

Sri *A. R.* Venkatachari, B.E., M.I.E. (Ind.), M.AM. SOC.C.E., I.S.E., continued to be the Chief Engineer (*Irrigation*) *in* the year under report.

Sri N. Govindaraja Ayyangar, B.A., B.O.E., continued to be the Chief Engineer (Special) till 31st January 1949 when Sri M. S. Thirumalae Ayyangar, B.E., M.I.E. (Ind.), I.S.E., took charge of the post and continued to be in charge of the post. The post of Chief Engineer (Special) was designated as Additional Chief Engineer (Irrigation) from that date.

Sri M. D. Narasimha Acharya, B.A., B.E., continued to be the Deputy Chief Engineer (Irrigation) in the year under report.

Sri V. A. Krishnaswami, B.E., continued to be the Additional Deputy Chief Engineer (Irrigation) in the year under report.

Sri A. Krishnamurthi Ayyar, B.E., continued to bo the Deputy Chief Engineer (Special) during the year under report.

Chapter II.

A BIRD'S-EYE VIEW OF IRRIGATION IN MADRAS PRESIDENCY.

A brief summary of the irrigation systems in the Presidency is given below.

In the Circars, we first have in the extreme north of the Presidency, the Bahuda river and Padmapuramgedda irrigating an extent of 6,000 acres; next the Chicacole Minor Rivers System comprising a number of channels taking off from the rivers the Vamsadhara and the Langulya and also the hill stream Garibulagedda and irrigating about 67,000 acres. The Nagavalli system irrigates the next largest area in Visakhapatnam district. By means of a regulator across the river at Thotapalli, sufficient water is diverted through a main canal and its branch channels to irrigate roughly 28,000 acres. The project was completed in 1909 and has been of great benefit to the ryots. In the southern portion of the Visakhapatnam district, there are again a number of channels taking off from the Varaha and the Sarada rivers. The former system irrigates about 18,000 acres and the latter 9,000 acres.

The next is the Godavari delta. To those who have not the local knowledge the fact that the value of the crops now grown annually in this delta is several crores will convey a very meagre idea of the benefits of irrigation. The Godavari ryots have recently erected at Dowlaishwaram, Bobberlanka and Chettipetta statues to commemorate the memory of Sir Arthur Cotton, the originator of the scheme, and by doing so have shown their appreciation of what he has done for the district by his monumental works for securing copious supply of precious water to their lands. Roughly one and half million acres of both first and second crops are irrigated by the net work of canals and channels thousands of miles long; the value of the crops grown annually exceeds nine crores. The canals have been designed not only for irrigation but also for navigation. Sixty locks have been built and more are being considered. About 400 miles of canals are navigable for boats up to 90 tons capacity and the major part of the exports and imports from and to the

delta is conveyed by boat. That this connected system of navigation has helped a great deal to the prosperity of the Godavari and the Krishna ryots will be appreciated when it is stated that the cost of transport to Madras by water is only one-eighth to one-tenth of the cost of transport by cart or other means. For instance, the cost of transport per bag of rice from the Kakinada port to Rajahmundry is 6 pies whereas that from Nagapattinam port to Tanjore is four annas even though the distance to be covered is the same in both the cases; this is because water transport is available in the former and not in the latter case. By means of the Godavari and Krishna canals and Buckingham Canal, one can go by boat from Madras to Kakinada, a distance of 400 miles, and from Rajahmundry one can continue the journey by boat beyond Bhadrachalam right up to the Central Provinces, a further distance of 188 miles.

The next is the Krishna delta. Just over a century ago, famines were recurrent in these parts and the appalling conditions that were then prevailing induced the Government of the day to push forward the Godavari and Krishna projects. At Vijayavada in the Krishna district, an anicut was built across the Krishna in 1855 (shortly after the completion of the anicut at Dowlaishwaram). The anicut diverts water through a net work of canals and channels to irrigate over 9 lakhs acres in Krishna and Guntur districts. The Krishna canals are also navigable and the greater part of the trade of the deltaic portions of the two districts is carried on by boats. Our Godavari and Krishna projects are probably the most beneficial and most successful irrigation schemes ever executed by any Government in the world. They have improved the condition of the people of the districts beyond the highest expectations of the originator, while the return on the capital invested in building them has sufficed not only to maintain and keep the systems up to date but has provided a continuous source of revenue which has enabled Government to initiate other projects, far less attractive financially in less favoured districts.

It should be stated here that we have till now utilized only six per cent of the annual flow of the Godavari and seven per cent of the annual flow of the Krishna and we are still a great way from utilizing the large quantity of water that flows to the sea.

Leaving the rich districts of Guntur and Krishna and coming down to Nellore, we meet a dry and barren district but advantage has been taken of such facilities as exist for extending irrigation. Near the sea coast, the rainfall is generally favourable, and with the addition of some extra water, supplied by means of irrigation, excellent crops are grown. Nellore rice is famous for its quality. Two anicuts across the Pennar divert water to the Kanigiri and the Sarvapalli reservoirs and about 165,000 acres of paddy are cultivated under them annually. Further inland, the Mopad Reservoir built in 1921 as a famine-protective work has fulfilled the purpose for which it was intended.

Leaving Nellore, we shall divert from our course for a few moments and strike west and north-west to have a glimpse at Cuddapah, Kurnool, Bellary and Anantapur districts. These districts known as "Rayalaseema" are in the famine zone and are periodically liable to failure of rain and consequent drought. Irrigation in Rayalaseema is by the very nature of the country difficult. Rainfall with its consequential river and stream flow is the first requirement for a successful irrigation scheme and when rain fails in the locality we propose to benefit, we must look to some external source, for example, a river whose main catchment area is outside the districts liable to failure for supply. Irrigation schemes in Rayalaseema depending on local rains must, generally speaking, be of doubtful utility. Proposals for tapping the supplies from the perennial Tungabhadra have been under examination, for a pretty long time and it was only recently that an agreement was arrived at between the Hyderabad and Madras Governments in the matter of sharing the water for irrigation purposes. The Government have sanctioned the scheme which is now under execution. The reservoir to be formed by constructing a dam at Mallapuram near Hospet is designed to have a capacity of 113,000 m.c.ft. and to irrigate at present about 3 lakhs of acres in Madras. Larger area on the Madras side can

be irrigated when the final apportionment of waters has been made. Hydro-electric power will also be developed at two places along the canal. The project is estimated to cost about Rs. 17 crores at present prices. It is hoped that the spectre of famine in the Rayalaseema will vanish with the completion of the project in spite of the general deficiency of rainfall and the heavy black cotton soils in these parts. The Kurnool-Cuddapah canal which flows through a black cotton belt has not been successful though in years of deficient rainfall its water is eagerly sought after by the ryots for their crops.

South from Nellore we come to Chingleput where there are no major irrigation schemes, but about 450,000 acres are irrigated by as many as 653 tanks. The district is peculiarly suited to tank irrigation; rainfall is generally favourable and the topography of the district favours this method of irrigation.

In South Arcot district also, there is a large number of tanks which irrigate over 300,000 acres. In addition, advantage has been taken of the fact that the district is traversed by two fairly large rivers, the Penniar and the Vellar. An anicut across the Penniar at Tirukkoyilur diverts sufficient water for about 30,000 acres. Regulators combined with road bridges have been built across the Vellar at Toludur and the Shatiatope; the former diverts water to Willingdon reservoir for over 25,000 acres (the ayacut is still expanding) and the latter diverts water through the Vellar Rajan channel and its branches to irrigate about 34,000 acres between Cuddalore and Porto Novo. Coleroon water is diverted at the Lower Anicut to irrigate about 118,000 acres in Chidambaram taluk. Besides, there are two anicuts at Vriddhachalam and Mehmattur across Manimutha nadhi, a branch of the Vellar, which irrigate about 10,000 and 5,000 acres respectively.

Deviating from the southerly course for a few moments, we meet the North Arcot, Salem and Coimbatore districts. The Palar river which rises in Mysore is the main feeder for North Arcot. Water is diverted through a series of canals and channels of the Palar anicut, 15 miles from Vellore, to irrigate over 100,000 acres. The district had many old tanks which have been retained and which now form an essential part of the system. Flow in the Palar is intermittent and in the old tanks the flood flow of the river is stored which without tanks would be wasted over the anicut. The Poiney anicut in the same district irrigates over 36,000 acres. The Cheyyar anicut also in the same district irrigates over 37,000 acres.

The Salem district is particularly not favoured by nature. The largest irrigation scheme in it is Barur. An anicut across the Penniar diverts water to the Barur reservoir which irrigates over 7,000 acres. The district depends mainly on tanks many of which get a supply over and above that contributed by their own catchment through channels taking off from anicuts built across adjacent streams. Though Mettur reservoir is in the district it has not been possible owing to very unfavourable conditions to devise any scheme to benefit Salem from this source. The Cauvery channel in Namakkal taluk irrigates 7,000 acres of very rich and fertile lands. Proposals are, however, under consideration to provide irrigation for about 40,000 acres of lands in the district by pumping from the river Cauvery.

The Coimbatore district depends mainly on the Bhavani which irrigates at present a large area of paddy. There are in addition several tanks and the waters of the Chitrachavadi, the Noyel and the Amaravathi are also utilized to the greatest extent possible by means of anicuts.

Continuing the southerly route from South Arcot, Tanjore is reached. Irrigation of about 7·8 lakhs of acres has been practised in Tanjore for centuries and with the modern works recently built, the ayacut now is about 9 lakhs of acres. The Cauvery-Mettur Project completed in 1934 is intended to ensure supply to the new delta as well as to extend irrigation by 301,000 acres in Pattukkottai, Mannargudi and Arantangi taluks. Tanjore has had a hoary tradition of irrigation works dating back to some 2,000 years. The benefits of Mettur reservoir to landholders in Tanjore delta are manifold. The reservoir acts as a flood moderator and protects the Tanjore ryots from the ravages of the Cauvery floods in the south-west monsoon to which they were subject hitherto. It secures to the ryots the benefits of early supplies in June and ensures steady and regular flow throughout the irrigation season.

The Tiruchirappalli district, like Tanjore, depends mainly on the Cauvery *for its* irrigation and prosperity. Many channels take off directly from the river to irrigate about 135,000 acres of fertile valuable lands.

Mathurai benefits mainly from the Periyar project. A dam built across the Periyar river in Travancore holds up water in the Periyar lake and a tunnel 5,700 feet long, conveys this water to the Vaigai valley and thence to Mathurai. One hundred and thirty-four thousand acres roughly are irrigated by the Periyar project. The difference that this scheme has made to the prosperity of Mathurai district is enormous. The chief merit lies in its sociological effects on the population of the district. The Kallars and Maravars whose habits of life were none too helpful to the society have now settled down in peace and prosperity to tilling land and adding to the wealth of the country.

The Tirunelveli district, which adjoins Mathurai, depends mainly on the Tambraparni river across which several anicuts have been built to irrigate about 75,000 acres. The irrigated portion of Tirunelveli is noted for its fertility.

In Tirunelveli, the Papanasam Hydro-Electric Scheme involving a dam 170 feet high on the Tambraparni has been completed. Though the reservoir is formed mainly for power, it will benefit irrigation also.

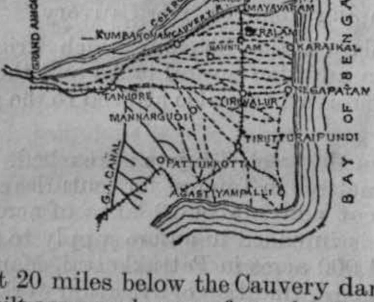
Tank irrigation is of the greatest importance in this Presidency where 2,670,000 acres are irrigated under tanks. Similarly, wells are another important source of supplies and are responsible for irrigation of about 1,540,000 acres. Attempts are being made to extend well irrigation by means of electric pumps in suitable areas.

Chapter III.

Brief Description of Important Irrigation and Navigation Works.

The Cauvery Delta System.—The Cauvery rises in Coorg and flows for a considerable distance over the Mysore plateau. It then drops into the plains of Madras at the Hogainkal or Megadatu falls. The chief tributaries of the river are the Hemavathi, Lakshmanathirtha and Kabbini in Mysore and the Bhavani (rising on the Nilgiris) in Madras. The Cauvery is 500 miles long and drains 31,000 square miles. The river benefits by the south-west and north-east monsoons and irrigates a large area in Mysore before it enters Madras. There are two big reservoirs on the river—the Krishnarajasagara near Mysore and the Stanley Reservoir near Salem. Hydro-electric power is developed at Sivasamudram and at Stanley Dam at Mettur, at the former by utilizing the natural fall of the river and at the latter by utilizing the head due to storage at the dam.

Irrigation in the Cauvery Delta System is of great antiquity dating back to the ancient Hindu kings of Tanjore—said to be about the second century B.C. The delta begins at the head of the Srirangam Island where the river divides into two, the right arm called the Cauvery carrying irrigation supplies and the left arm, the Coleroon being the flood carrier. There is a barrage with lift shutters—the Upper anicut—across the Coleroon at its head to divert requisite supplies to the Cauvery over the Cauvery dam.



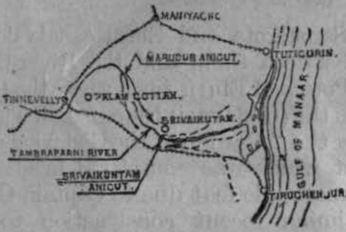
About 20 miles below the Cauvery dam is the Grand Anicut, an ancient masonry anicut built across a by-pass from the Cauvery into the Coleroon below the Srirangam Island. This anicut, intended to hold up and divert the normal flow of the Cauvery to the rivers supplying Tanjore delta, was converted into a regulator with lift shutters to permit effective disposal of surplus from the Cauvery and for passing supplies to the Lower Coleroon Anicut System.

At the Grand Anicut, the Cauvery branches into the Cauvery and the Vennar, which in turn throw off a number of branches and irrigate the fertile lands of the Tanjore delta, the well-known "Granary of South India." The new Grand Anicut canal of the Cauvery-Mettur Project also takes off at this point.

The delta is long, fertile and level, some 2,000 square miles in area with a seaboard over a 100 miles long extending from Point Calimere to the south as far north as Porto Novo and some distance beyond to Cuddalore. It is served with a net work of rivers and channels, supplies into which are controlled by several regulators. Many of the smaller rivers of the delta function both as irrigation and drainage channels.

The area irrigated under the Cauvery Delta System alone is about 870,000 acres (first crop) and just over a million acres including the second crop. The value of the crops yielded is about Rs. 9·82 crores. Over 87 lakhs have been spent on improvements since the system was taken over from the Tanjore kings. The system yields a return of about 12·47 per cent on the capital outlay after giving credit for about 38 lakhs of rupees towards old revenue.

Srivaikuntam Anicut System.—The Srivaikuntam anicut is the last of the anicuts across the Tambraparni in Tirunelveli district. Two channels take off at the anicut. On the left is the North Main channel feeding a series of tanks and finally emptying into the Morumpallam tank. On the right side, the South Main channel takes off and supplies the large Kadamba tank and a series of tanks below it and irrigation under it extends as far as Tiruchendur with its famous temple on the seashore. The system irrigates about 26,000 acres. The capital expenditure was about Rs. 17·75 lakhs and the return is 5·58 per cent on the outlay.



The Godavari Delta System.—The Godavari rises in the Western Ghauts within 50 miles of the Arabian sea and flows across the Peninsula for 900 miles before it falls into the Bay of Bengal. Its chief tributaries are the Manjira from Hyderabad and the Pranahita made up of three smaller streams from the Central Provinces, the Indravathi and the Sabari. Shortly after the Sabari joins it, the Godavari now deep and narrow winds its way through the spurts of the Eastern Ghauts and for 2 miles it flows through a picturesque gorge clothed with luxuriant tropical vegetation. Some distance below, it leaves the last ranges of the Ghauts, enters the plains at Polavaram and flows onward as a broad and shallow river until some distance below Rajahmundry where it divides into two main branches, the Gautami and the Vasishta Godavari rivers. Between the two arms lies the central delta, while the eastern and western deltas lie to the east and west of the two arms respectively. The two arms split up into branches, as they approach the sea, dividing the central delta into a number of islands. The river drains about 115,000 square miles and carries as much as $1\frac{1}{2}$ million cubic feet per second in very high floods.



Prior to 1840, the Godavari district was frequently the scene of bad famines. In 1832–33, a terrible famine ravaged the district and the calamitous famine of 1840–41 followed after some more bad years. The recurring famines, the decreasing population and the dwindling revenue spurred the Government to action and Major Cotton (later Sir Arthur Cotton), who had just then completed great improvements in

Tanjore, proposed the construction of an anicut across the Godavari at *Dowlaishwaram* with three canals, one for each of three deltas. The works were sanctioned almost immediately and carried out expeditiously under his guidance. It is to the genius, keenness and intrepidity of Sir Arthur Cotton, that Madras owes these monumental works unprecedented both as to type and magnitude and which have proved to be a veritable gold mine.

The Godavari anicut system consists of an anicut and three main canals irrigating three deltas. The anicut is in four sections, linking the islands in the broad river, the Dowlaishwaram section 4,839 feet long, the Ralli section 2,859 feet long, the Maddur section 1,550 feet long, and the Vazeswaram section 2,601 feet long. It was subsequently found necessary to raise the anicut slightly and fit up falling shutters, 2-feet high on the crest. In 1935, the 2-feet shutters were replaced by 3-feet shutters. The shutters which fall automatically during floods are lifted as the flood subsides by means of power-operated ploughs, so as to maintain the requisite water level in the river.

The head works of the canals consist of a head sluice, and under sluice and a head lock for each of the three deltas. The eastern delta is about 450 square miles, the central delta 500 square miles, while the western delta about 1,000 square miles in extent stretches down to the Collair lake.

In the eastern and western deltas, the Samalkota and Eluru canals define the limits of irrigation to the areas enclosed between them and the River Godavari. They also form the link between Kakinada Port and Eluru town where the (Krishna) Eluru canal of the Krishna Delta System joins the (Godavari) Eluru canal. The central delta, particularly the "Nagaram" island, is the "Garden of the Godavari district" and is noted for the Gannavaram aqueduct which was completed in about eight months in the fifties of the last century, a remarkable feat due to Captain Orr. The Polavaram aqueduct at Annampalli is a similar recent construction to irrigate Polavaram island. The river and its branches are banked throughout to protect the deltas from the floods.

The network of canals in all the deltas are navigable throughout their length for eleven months in the year and carry annually cargo valued at nearly Rs. 24·71 crores besides timber worth about Rs. 2·40 crores and passengers over a million a year.

The canals irrigate about 820,000 acres but the total area irrigated during the year including the second-crop area is over 1 million acres. The value of crops grown is Rs. 11·77 crores. The capital outlay on the system is about Rs. 2·20 crores and the return is 18·22 per cent.

Pennar River Canals System.—The system consists of two anicuts, one at Sangam and the other at Nellore. Two canals take off at the Sangam anicut and the left, one to feed the Duvvur tank and the other the large Kanigiri tank, one of the largest tanks in the Circars. Another channel taking off at right side of the anicut feeds the Nellore tank. At the Nellore anicut about 20 miles down-stream of Sangam, a canal takes off on the right and feeds a number of tanks, the largest of which is the Sarvapalli tank. The Sangam anicut has recently been raised by 1 foot and with Nellore anicut system irrigates about 167,500 acres; the capital expenditure is Rs. 71 lakhs and the return is 5·88 per cent.



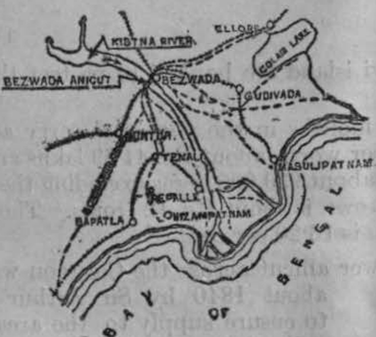
The Shatiatope Anicut System.—The system is a combined tank and canal system served by the Vellar Rajan channel taking off from the Shatiatope anicut across the Vellar. The old anicut was converted into a bridge and regulator fitted with lift

shutters about 1906. The system irrigates about 33,000 acres in South Arcot district and irrigation extends almost as far east as Cuddalore. The Perumal tank is one of the largest tanks and is the terminal tank of the system. The capital expenditure on the system is about Rs. 11 lakhs and the return is 9·23 per cent.

The Periyar System.—The main feature of the Periyar System is the diversion across the Peninsula into the Bay of Bengal of a large river which nature had ordained should flow into the Arabian Sea. A huge dam across an inaccessible gorge in Travancore, about 3,000 feet above sea level, in malarial ridden jungle, forms a picturesque lake in the hills with a useful capacity of about 9,800 million cubic feet. The project is due to the genius of Colonel Pennycuick. The dam is of concrete with a masonry facing on the lake side about 170 feet high above river bed at the deepest point. A tunnel 5,700 feet long has been bored through the ridge on the east to carry the waters of the lake to the plains of Mathurai. The water flows into the Suruliyar, tributary of the Vaigai, and after irrigating about 12,700 acres in the Suruliyar Valley, is again picked up at the Peranai regulator across Vaigai about 80 miles down-stream of the tunnel and diverted into the Periyar main canal about 35 miles long. The system irrigates about 143,000 acres in Mathurai district. The capital expenditure on the system is about 108 lakhs and the return is about 6 per cent.



The Krishna Delta System.—The Krishna rises in the Western Ghauts near Mahabaleswar, some 4,000 feet above the sea level and runs southwards through the Bombay Presidency for some distance before it turns east into Hyderabad and receives the Bhima. Further down, the Tungabhadra joins it and from here the river is for a considerable distance the boundary between Madras and Hyderabad. The last important tributary to join is the Musi. The river after flowing through a narrow gorge in the Nallamalais enters the plains of the Coromandal coast studded with hills. The last of the three hills is at Vijayavada where the river flows between two of them hardly 6 furlongs apart. Stretching away on both sides of the river beyond Vijayavada lie the two sections of the delta, the eastern delta lying on the left side and the western delta lying on the right. For 40 miles below, the river runs in a single stream. It then throws out the Puligedda branch. Between this and the main river lies the Divi island. The main river then flows for 15 miles and splits into three branches before it empties into the sea. The river drains 97,000 square miles and its flood discharge is about a million cubic feet per second.

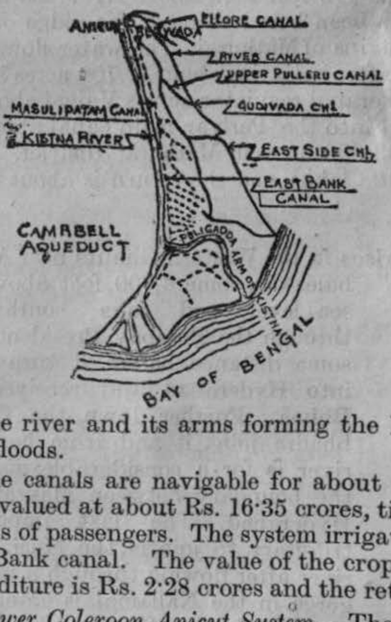


The history of the Krishna anicut follows almost the same course as that of the Godavari. Sir Arthur Cotton, who built the Godavari anicut, was again responsible for the anicut at Vijayavada with its two canals, supplying the two sections of the delta on either bank of the river.

The anicut is about 6 furlongs in length; its crest was raised at a later date by one foot and fitted with 3 feet falling shutters to improve the supplies to the delta. In 1935, even this was found insufficient and 6-feet falling shutters were substituted. The shutters are tripped by hydraulic pressure to pass floods and a steam plough is used to lift them up as the flood subsides. The head works of each canal consist of head and under sluice and a head lock.

The eastern delta has an area of about 1,160 square miles and stretches as far north as the Collair. The western delta is about 950 square miles and extends to the south as far as Pedda Ganjam. The Kistna-Ellore canal in the eastern delta connects the Godavari-Ellore canal in the north and the Commamur canal of the western delta joins the Buckingham canal in the south. These contour canals and the interior canals form a net-work of irrigation and navigation canals affording means of irrigation and transport for the two deltas. The Divi island was irrigated with water pumped from the river by diesel engine driven pumps. Pumping from the river was the practice till 1935 when the Campbell aqueduct was built at Puligedda to carry the Kistna East Bank canal across the river to Divi. This canal now irrigates by direct flow the entire ayacut in the Divi island.

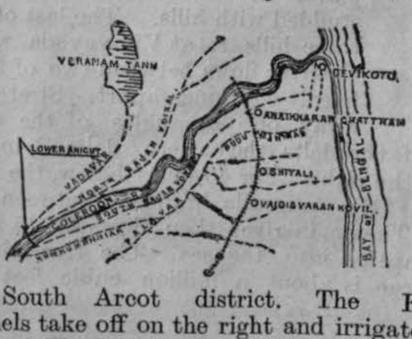
The Kistna East Bank canal takes off at about mile 4/0 of the Masulipatam canal. The canal is navigable and runs alongside the river for a considerable distance before it crosses the Puligedda arm of the Kistna river by the Campbell aqueduct. The aqueduct is the longest reinforced concrete aqueduct bridge in India and carries a roadway 16 feet wide and a footpath 4 feet wide. The aqueduct is submersible during the high floods. The capital expenditure on the canal is Rs. 58 lakhs and the return is 7·76 per cent.



The river and its arms forming the Divi island are banked to protect the delta from floods.

The canals are navigable for about 10 months in the year and carry annually cargo valued at about Rs. 16·35 crores, timber worth about Rs. 44·59 lakhs and over 2 lakhs of passengers. The system irrigates about 930,000 acres excluding the Kistna East Bank canal. The value of the crops grown is about Rs. 12 crores. The capital expenditure is Rs. 2·28 crores and the return is 16·20 per cent.

Lower Coleroon Anicut System.—The lower anicut across the Coleroon was built about 1840 by Sir Arthur Cotton to ensure supply to the areas originally irrigated by river channels. The old works were substantially improved in 1906. The weir was converted into a regulator of 70 vents fitted with lift shutters 33 feet 4 inches span and 8 feet high. The Vadavar and North Rajan channels taking off on the left side irrigate lands in the Chidambaram taluk of the South Arcot district. The Kumikimanniyar and South Rajan channels take off on the right and irrigate lands in the Shiyali taluk of the Tanjore district. The Vadavar is a contour canal supplying the large Veeranam tank, which also supplements supplies in the river valleys through a sluice at its northern end. The system irrigates about 118,700 acres. The capital expenditure is Rs. 30 lakhs and the return is 9·17 per cent.



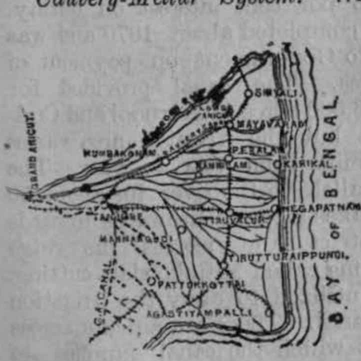
Willingdon Reservoir.—Originally known as the Toludur Project is a comparatively new work in South Arcot district opened in 1923. There is a bridge and regulator fitted with lift shutters across the Vellar at Toludur from which a canal three and a half miles long takes off and feeds the reservoir which has a capacity of about 2,400 million cubic feet. The bridge carries the Great Southern Trunk Road from Madras to Trichinopoly. From the reservoir, a channel takes off and branches into the high and low level channels a short distance below the head. The system now irrigates about 25,000 acres. The capital expenditure on the system is about Rs. 26 lakhs and the return is 2·71 per cent.



Polavaram Island System.—The system consists of a canal taking off the Bank Canal of the Godavari Central delta about half a mile above Annampalli lock. The canal exceeds the Vriddha Goutami by a masonry aqueduct and irrigates the Polavaram island enclosed by the two branches of the Goutami Godavari. The system irrigates about 17,500 acres in East Godavari district. The capital expenditure is about Rs. 17 lakhs and the return is 5·5 per cent.



Cauvery-Mettur System.—While the south-west monsoon in the hills is fairly heavy and dependable, the north-east monsoon supplies to the Cauvery are irregular. The caprices of the north-east monsoon have frequently affected cultivation in Tanjore. Moreover, there is usually a break of about six weeks between the two monsoons during which period the supply in the river is very low and insufficient for irrigation requirements. The chief aim of the Cauvery-Mettur system is to remedy this state of affairs by storing the excess water during floods and passing it down later when the natural flow in the river falls below requirements. It is also intended to irrigate 301,000 acres of new land chiefly in the Mannargudi, Pattukkottai and Arantangi taluks of the Tanjore district.



The system consists of a large reservoir at Mettur known as the Stanley reservoir and a canal known as the Grand Anicut canal in Tanjore taking off above the Grand Anicut.

The Stanley reservoir has a waterspread 60 square miles in area and holds 93,500 million cubic feet of water when full. The lake is formed by a masonry dam across the valley of the Cauvery. It is 5,300 feet long and 214 feet high at the deepest point. It is almost the biggest dam in the world and costs Rs. 4·8 crores. There are two sets of sluices in the dam, the high and low level sluices with sills at +720 and + 670 while the F.R.L. is + 790 and the M.W.L. is 796·00. The river floods are surplussed over an escape at the left flank fitted with lift shutters 60 feet long and 20 feet high and an emergency escape at the right flank. The design however provides for raising these by 10 feet high if it becomes necessary.

The sluices and the surplus shutters are worked by electric power but *it is possible* to work any of them by hand if required. The dam also incorporates four sets of cast iron lined sluices 8 feet 6 inches diameter. These enable supplies to be drawn for the development of hydro-electric power below the dam and a hydro-electric power station has been built below the dam and is in operation since 1937. Irrigation supplies for the new area under the reservoir are passed into the river below the dam and picked up at the Grand Anicut about 120 miles downstream. The new canal called the Grand Anicut canal is a contour canal about 70 miles long has costed about Rs. 200 lakhs. It runs through Tanjore town, after passing which it throws out the large Kalianodai and Rajamadam branch canals. Down below there is a net work of branch channels and the system irrigates lands as far south as the Narasingha Cauvery.

The system is under development. It now irrigates about 332,000 acres. The capital outlay is Rs. 6·5 crores and the present rate of return on capital is 1·54 per cent.

Kattalai System.—The South Bank canal was excavated to replace the four old korambu channels—Marudur nattu vaikal, Mahadanapuram channel, Nangam channel and Uyyakondan channel taking off from the right bank of the Cauvery in Tiruchirappalli district, as irrigation under them was troublesome and uneconomical. Because the river-bed at the head of the South Bank canal had been badly scoured by the 1924 floods a bed regulator was constructed there. Five furlongs below its head, the canal divided into the High Level channel and the South Bank channel. The system irrigates about 67,000 acres. The capital expenditure was about Rs. 41 lakhs and return is 3·75 per cent.

Kurnool-Cuddapah canal.—The Kurnool-Cuddapah canal takes off from the Tungabadra from an anicut at Sunkesula about 15 miles upstream of Kurnool. The anicut and canal were constructed by the Madras Irrigation and Canal Company, Limited, incorporated in England in 1858 with a guarantee of 5 per cent interest on outlay. The work was completed about 1870 and was handed over to Government on payment of Rs. 3·02 crores. The canal provided for irrigation of 76,500 acres in Kurnool and Cuddapah districts but the irrigated area varies within wide limits from year to year. The canal runs parallel to the river for about 50 miles when it takes a turn southwards towards Cuddapah district and pierces the ridge between Pennar and Krishna valleys through a cutting called Mittakondala cutting. Below this point the Kali and Kundu rivers are utilized to carry the irrigation supplies, the canal serving mainly as navigation canal. There are anicuts across the Kundu river at Santhajuttur and at Rajoli at which the canal supplies are again picked up and used for irrigation in the Kurnool-Cuddapah canal and its branches. At about mile 180, the canal crosses the Pennar at Adinimeyapalli anicut and is continued on the right as far as Cuddapah town. The Kurnool-Cuddapah canal flows through black cotton soil and irrigates mostly dry crops. These crops do not require canal supply in years of good and well-distributed rainfall but in other years they require occasional irrigation. The canal is maintained at a heavy and recurring loss particularly because of its use in famine years. The canal was navigable throughout till 1934 when the reach below Lockinsula at mile 74/0 was closed to navigation, as there was little boat traffic, and costly replacement of a number of lock gates below Lockinsula was found involved.



The capital expenditure on the canal is about Rs. 234 lakhs and the return is about 0·67 per cent. It is the most expensive project (excluding Cauvery-Mettur Project) in Madras.

Barur Tank System.—The system consists of an anicut across the Ponniar at Nedungal, with a supply channel feeding the Barur tank in Salem district. The

supply channel also feeds a number of small tanks on the left bank while the two old channels, the Nedungal and Agaram channels, feed small tanks on the right bank.

The work on the tank and the supply channel was commenced as a famine relief work in 1877 and subsequently revised to include the anicut, etc. The work was completed in 1899. The system irrigates an area of about 7,000 acres.

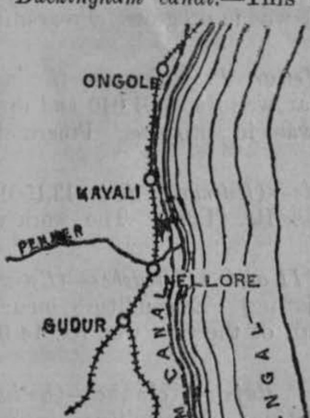
The capital expenditure is Rs. 4·5 lakhs and a return of 3·42 per cent is now obtained.

Nagavalli River System.—At Thottapalli in Visakhapatnam district a regulator has been built across the Nagavalli river and a channel about 22 miles long has been dug. The channel irrigates about 27,900 acres. The capital expenditure is about Rs. 18 lakhs return being about 2·30 per cent.

Bhavanasi tank.—This is a reservoir formed by an earthen bund about 2,500 feet long and 30 feet high across the Bhavanasi river in Guntur district with a capacity of about 175 million cubic feet. The reservoir irrigates about 700 acres. The capital expenditure is Rs. 2·65 lakhs and the return is 0·31 per cent.

Mopad System.—The Mopad system consists of a reservoir with an earthen bund about 70 feet high at the deepest point and more than a mile long, built across the Manneru river in Nellore district. The reservoir has a capacity of about 2,100 million cubic feet and irrigates lands in a tract where famines are frequent. The system irrigates about 12,500 acres. The capital expenditure on the system is about Rs. 24 lakhs and the return is 0·61 per cent.

Buckingham canal.—This canal is used entirely for navigation. It runs through Madras parallel and close to the Coromandel coast, joining up a series of natural backwaters and connects all the coastal districts with Guntur and South Arcot at the ends. The canal runs for 196 miles north of Madras and 62 miles south of Madras. At its northern end it is connected with the Commamur canal at the Krishna delta which in turn is connected to the Godavari canals running as far north as Kakinada. Due to its alignment close to the coast, the canal is difficult and costly to maintain. The navigability of the north canal is difficult and costly to maintain. The navigability of the north canal depends on the open sea bars at Ennore and Pulicat. In a bad year, water levels may drop and lead to considerable difficulty in navigation. The canal carries a large traffic in salt, shells, firewood, building materials and foodgrains and is one of the main feeders to the Madras market. It carries cargo of an estimated value of about Rs. 20·73 crores and about 98,000 passengers every year. The capital expenditure on the system is Rs. 95·72 lakhs and the return is minus 6·01 per cent.



Chapter IV.

Important Works carried out during the Year.

The important works under execution during the year are enumerated below under the categories Grow More Food and other works along with the particulars of expenditure and ayacut.

Works for which Capital and Revenue Accounts are kept.

I. **Cauvery Delta System**—*A. Grow More Food works*—(1) *Providing irrigation facilities to an extent of 800 acres of lands in Kambayanatham, etc., villages, Papanasam taluk, Tanjore district*—(*Estimate for works Rs.* 65,000).—Expenditure

incurred during the year was Rs. 790 and up to the end of the year was Rs. 66,658. The work was completed.

(2) *Construction of a bed regulator across the Cauvery at Jeddarpalayam River Conservancy Division—(Estimate Rs.* 8·092 *lakhs).*—Approximate ayacut 5,382 acres (existing). Expenditure incurred during the year was Rs. 3,05,064 and up to the end of the year was Rs. 6,38,321. The work was under execution. Programme for 1949–50, Rs. 100.

B. Other Works—(1) *Improvements to Cauvery delta drainage schemes—(Estimate Rs.* 18,31,100).—Expenditure incurred during the year was Rs. 6,45,783 and up to the end of the year was Rs. 8,61,516. The works were in progress.

(2) *Improvements to Marakkakorayar and Kilathangiar in scheme estimate for drainage improvements to Cauvery delta—(Estimate Rs.* 1,93,500).—Expenditure incurred during the year was Rs. 40,393 and up to the end of the year was Rs. 1,71,855. The work was in progress. Programme for 1949–50, Rs. 4,18,000.

(3) *Improvements to Valakkarai drainage sluice in Nagapattinam taluk—(Estimate Rs.* 17,000).—Expenditure incurred during the year was Rs. 3,143 and up to the end of the year was Rs. 20,818. The work was in progress. Programme for 1949–50, Rs. 1,000.

II. **Cauvery-Mettur Project**—*A. Grow More Food works*—(1) *Extension of irrigation beyond Narasinga Cauvery—(Estimate Rs.* 19,30,000).—Approximate ayacut 15,000 acres. Expenditure incurred during the year was Rs. 1,51,271 and up to the end of the year was Rs. 11,55,138. The work was in progress. Programme for 1949–50, Rs. 1,80,000.

(2) *Improvements to drains in Cauvery-Mettur Project area—(Estimate Rs.* 6,02,700).—Expenditure incurred during the year was Rs. 3,81,040 and up to the end of the year was Rs. 4,16,936. The work was in progress. Programme for 1949–50, Rs. 1,36,000.

(3) *Improvements to Kalumangalam lands—(Estimate Rs.* 13,150).—Expenditure incurred up to the end of the year was Rs. 11,355. The work was in progress. Programme for 1949–50, Rs. 500.

(4) *Providing irrigation facilities to Adappar II and III reaches—(Estimate Rs.* 14,000).—Approximate ayacut 11,445 acres (existing). Expenditure incurred during the year was Rs. 13,998 and up to the end of the year was Rs. 14,098. The work was completed.

(5) *Remodelling the Umbalacheri South Rajan channel—(Estimate Rs.* 36,000).—Approximate ayacut 2,941 acres (existing). Expenditure incurred during the year was Rs. 32,976 and up to the end of the year was Rs. 33,076. The work was completed.

(6) *Fitting up falling shutters to Kattalai bed regulator—(Revised Estimate Rs.* 5,82,820).—Approximate ayacut 2,875 acres. The work was started during the year and an expenditure of Rs. 1,54,276 was incurred. Programme for 1949–50, Rs. 2,75,000.

(7) *Realigning the Uyyacondan extension channel—(Estimate Rs.* 60,000).—Approximate ayaçut 2,108 acres (existing). The work was started during the year and an expenditure of Rs. 20,032 was incurred. Programme for 1949–50, Rs. 46,000.

(8) *Excavation of a supply channel to Sithakadu and Kadakadappai villages from Cauvery-Mettur Project—(Estimate Rs.* 49,300).—Approximate ayacut 356 acres. The work was started during the year and an expenditure of Rs. 3,493 was incurred. Programme for 1949–50, Rs. 33,800.

B. Other works—(1) *Diversion of Sillaipillayarputhur channel—(Estimate Rs.* 1,02,600).—Expenditure incurred during the year was Rs. 17,709 and up to the end of the year was Rs. 98,140. The work was in progress.

(2) *Improvements to Sammandan Cauvery—(Estimate Rs.* 73,000).—Approximate ayacut 64 acres (new) and 2,244 acres (existing). The work was

started during the year and an expenditure of Rs. 13,984 was incurred. Programme for 1949-50, Rs. 61,000.

III. **Godavari Delta System**—*A. Grow More Food works*—(1) *Extension of irrigation under Nimmakayala Kothapalli channel*—(*Estimate Rs.* 36,580).—Approximate ayacut 643 acres. Expenditure incurred during the year was Rs. 6,062 and up to the end of the year was Rs. 34,133. The work was in progress.

(2) *Providing irrigation facilities to the dry lands in Antervedi village by extending Addalapalem and Mamidithota channels*—(*Estimate Rs.* 1,47,200).—Approximate ayacut 2,076 acres. Expenditure incurred during the year was Rs. 9,374 and up to the end of the year was Rs. 1,41,496. The work was completed.

(3) *Providing irrigation facilities to certain high level lands between Ralli and Lolla locks in Komarajulanka, etc., villages*—(*Estimate Rs.* 2,05,800).—Approximate ayacut 1,660 acres. Expenditure incurred during the year was Rs. 49 and up to the end of the year was Rs. 1,30,253. The work was completed.

(4) *Extension of Sakhinettipalli Weir channel and extension of Vasishta left flood bank*—(*Estimate Rs.* 94,800).—Approximate ayacut 671 acres. Expenditure incurred during the year was Rs. 1,222 and up to the end of the year was Rs. 52,663. The work was completed.

(5) *Remodelling the Kodamanchilli channel of bank canal*—(*Estimate Rs.* 60,750).—Approximate ayacut 610 acres. Expenditure incurred during the year was Rs. 8,425 and up to the end of the year was Rs. 38,293. The work was in progress.

(6) *Extension of Vadlur-Tetali channel*—(*Estimate Rs.* 1,10,500).—Approximate ayacut 649 acres. Expenditure incurred during the year was Rs. 1,123 and up to the end of the year was Rs. 96,187. The work was completed.

(7) *Sankaraguptham Scheme*—(*Estimate Rs.* 77,050).—Approximate ayacut 663 acres. Expenditure incurred during the year was Rs. 1,144 and up to the end of the year was Rs. 58,885. The work was completed.

(8) *Extension of irrigation under Sesharayadu Codu channel*—(*Estimate Rs.* 10,900).—Approximate ayacut 383 acres. Expenditure incurred during the year was Rs. 547 and up to the end of the year was Rs. 6,575. The work was completed.

(9) *Providing irrigation facilities to waste lands in tail end of Benda No.* 2 *channel*—(*Estimate Rs.* 85,000).—Approximate ayacut 874 acres. Expenditure incurred during the year was Rs. 14,206 and up to the end of the year was Rs. 50,104. The work was completed.

(10) *Extension of Hospital channel at* 26/5-³ *of left bank of Gannavaram canal*—(*Estimate Rs.* 62,900).—Approximate ayacut 382 acres wet; 100 acres garden. Expenditure incurred during the year was Rs. 7,325 and up to the end of the year was Rs. 57,559. The work was completed.

(11) *Constructing a lock at Podalada at* 31/4-7 *of Gannavaram canal*—(*Estimate Rs.* 1,25,000).—Approximate ayacut 17,774 acres (existing). Expenditure incurred during the year was Rs. 35,886 and up to the end of the year was Rs. 1,22,355. The work was completed.

(12) *Peravaram Pumping Scheme*—(*Estimate Rs.* 9,74,800).—Approximate ayacut 9,600 acres. Expenditure incurred during the year was Rs. 58,321 and up to the end of the year was Rs. 7,38,114. The work was almost completed.

(13) *Providing irrigation facilities to dry lands of Palivela, Avidi and Ganti villages*—(*Estimate Rs.* 31,800).—Approximate ayacut 426 acres. Expenditure incurred during the year was Rs. 809 and up to the end of the year was Rs. 27,885. The work was in progress.

(14) *Providing irrigation facilities to the dry lands of Wadapalem and Kandrika villages*—(*Estimate Rs.* 37,000).—Approximate ayacut 383 acres. Expenditure incurred during the year was Rs. 62 and up to the end of the year was Rs. 13,941. The work was in progress.

(15) *Providing irrigation facilities to certain lands by extending Komatitippa and Niditippa channels*—(*Estimate Rs.* 13,100).—Approximate ayacut 133 acres. An expenditure of Rs. 1,699 was incurred on the scheme. The work was in progress. Programme for 1949–50, Rs. 8,000.

(16) *Extension of Mahadevivalasa distributary*—(*Estimate Rs.* 15,630).—Approximate ayacut 71 acres. The work was started during the year and an expenditure of Rs. 1,001 was incurred.

(17) *Providing irrigation facilities to lands in Undrajavaram, etc., villages*—(*Estimate Rs.* 59,500).—Approximate ayacut 503 acres. The work was started during the year and an expenditure of Rs. 519 was incurred. Programme for 1949–50, Rs. 10,000.

B. Other works—(1) *Remodelling Pallamkurru Nos. I and II channels*—(*Estimate Rs.* 1,28,839).—Approximate ayacut 536 acres. Expenditure incurred during the year was Rs. 2,428 and up to the end of the year was Rs. 1,01,764. The work was completed.

(2) *Remodelling and providing R.C. bridge over the remaining* 45 *vents of the Gannavaram aqueduct*—(*Estimate Rs.* 24·6 *lakhs*).—Expenditure incurred during the year was Rs. 6,46,207 and up to the end of the year was Rs. 22,38,561. The work was in progress.

(3) *Protecting the front and rear aprons of the Gannavaram aqueduct with R.C. sheet piles*—(*Estimate Rs.* 7,67,000).—Expenditure incurred during the year was Rs. 16,210 and up to the end of the year was Rs. 7,11,537. The work was in progress.

(4) *Reconstructing the collapsed vents of the Gannavaram aqueduct*—(*Estimate Rs.* 6,00,000).—Expenditure incurred during the year was Rs. 48,560 and up to the end of the year was Rs. 87,417. The work was completed.

(5) *Excavating Kummarigunta distributary*—(*Estimate Rs.* 34,300).—Expenditure incurred during the year was Rs. 9,052 and up to the end of the year was Rs. 36,271. The work was in progress.

(6) *Forming flood bank and providing revetments between the heads of Lukulam and Polaki channels*—(*Estimate Rs.* 53,000).—Expenditure incurred during the year was Rs. 12,970 and up to the end of the year was Rs. 72,560. The work was completed.

IV. **Kistna Delta System**—*A. Grow More Food Works*—(1) *Excavating a channel to Choragudi and Atchampalem villages*—(*Estimate Rs.* 96,565).—Approximate ayacut 777 acres. Expenditure incurred during the year was Rs. 15 and up to the end of the year was Rs. 8,311. The work was in progress. Programme for 1949–50, Rs. 65,000.

(2) *Providing irrigation facilities to Rudravaram and Chigurukota villages*—(*Estimate Rs.* 31,200).—Approximate ayacut 636 acres. Expenditure incurred during the year was Rs. 5,248 and up to the end of the year was Rs. 11,238. The work was in progress. Programme for 1949–50, Rs. 22,000.

(3) *Excavating the Seethampeta channel from Ellore canal to Bhimadole*—(*Revised Estimate Rs.* 4,96,070).—Approximate ayacut 5,000 acres. Expenditure incurred during the year was Rs. 1,54,910 and up to the end of the year was Rs. 2,86,989. The work was in progress. Programme for 1949–50, Rs. 1,80,000.

(4) *Providing irrigation facilities to Rachapatnam and Kallapalem channels*—(*Estimate Rs.* 32,800).—Approximate ayacut 543 acres. Expenditure incurred during the year was Rs. 4,343 and up to the end of the year was Rs. 15,009. The work was in progress. Programme for 1949–50, Rs. 17,000.

(5) *Providing irrigation facilities to Bandar Fort block*—(*Estimate Rs.* 20,000).—Approximate ayacut 2,100 acres (existing). Expenditure incurred during the year was Rs. 205 and up to the end of the year was Rs. 16,529. The work was in progress. Programme for 1949–50, Rs. 200.

(6) *Constructing an anicut across Isukuvagu near Krosur*—(*Estimate Rs.* 40,100).—Approximate ayacut 178 acres. Expenditure incurred during the

year was Rs. 30 and up to the end of the year was Rs. 434. The work was in progress.

(7) *Constructing an anicut across Yedduvagu [Bhurugubanda Project]—(Estimate Rs.* 1,50,000).—Approximate ayacut 490 acres. Expenditure incurred during the year was Rs. 25,917 and up to the end of the year was Rs. 26,044. The work was in progress.

(8) *Extending the Ponukumad channel—(Estimate Rs.* 13,510) —Approximate ayacut 609 acres (existing). A total expenditure of Rs. 100 was incurred on the scheme. The work was in progress. Programme for 1949–50, Rs. 7,500.

(9) *Providing irrigation facilities to Pedapatnam, Narayanapatnam blocks of Kistna Eastern delta by extending the Arthamur channel—(Estimate Rs.* 2,80,000).—Approximate ayacut 2,722 acres. The work was started during the year and an expenditure of Rs. 41,665 was incurred.

(10) *Extending irrigation under Muniyeru main channel—(Estimate Rs.* 3,69,500).—Approximate ayacut 2,800 acres. The work was started during the year and an expenditure of Rs. 20,016 was incurred. Programme for 1949–50, Rs. 2,50,000.

(11) *Bandar west block—(Estimate Rs.* 57,000).—Approximate ayacut 1,039 acres. The work was started during the year and an expenditure of Rs. 10,419 was incurred.

(12) *Sankarshnapuram drainage scheme—(Estimate Rs.* 26,800).—Approximate ayacut 350 acres (existing). The work was started during the year and an expenditure of Rs. 8,329 was incurred. Programme for 1949–50, Rs. 10,000.

(13) *Excavation of new Kalavapamula channel—(Estimate Rs.* 25,870).—Approximate ayacut 545 acres. The work was started during the year and an expenditure of Rs. 4,695 was incurred. Programme for 1949–50, Rs. 10,000.

(14) *Vaivaka Peddathummidi block—(Estimate Rs.* 78,240).—Approximate ayacut 550 acres. The work was started during the year and an expenditure of Rs. 24,006 was incurred. Programme for 1949–50, Rs. 28,000.

B. Other works—(1) *Excavating the new Arthamur channel—(Estimate Rs.* 14,900).—A total expenditure of Rs. 18,448 was incurred on the scheme up to the end of the year. The work was under execution.

(2) *Excavating the new Nidamanur channel—(Estimate Rs.* 24,870).—Expenditure incurred during the year was Rs. 337 and up to the end of the year was Rs. 24,541. The work was in progress.

(3) *Extending the existing irrigation sources for the irrigation of non-guaranteed lands in Mallavole, Rudravaram, etc., villages—(Estimate Rs.* 15,000).—Approximate ayacut 1,500 acres. Expenditure incurred during the year was Rs. 527 and up to the end of the year was Rs. 15,859. The work was in progress. Programme for 1949–50, Rs. 21,000.

(4) *Providing irrigation facilities to Guruzada block—(Estimate Rs.* 22,420).—Expenditure incurred during the year was Rs. 3,343 and up to the end of the year was Rs. 27,962. The work was in progress. Programme for 1949–50, Rs. 1,000.

(5) *Remodelling the Bhimanadhi channel—(Estimate Rs.* 32,000).—Expenditure incurred during the year was Rs. — 53 and up to the end of the year was Rs. 8,412. The work was in progress. Programme for 1949–50, Rs. 16,000.

(6) *Excavation of the Krishna Western High Level channel—(Estimate Rs.* 6,07,043).—Expenditure incurred during the year was Rs. 11,326 and up to the end of the year was Rs. 6,24,381. The work was in progress. Programme for 1949–50, Rs. 25,000.

(7) *Extending the wharf at Vijayavada below girder bridge of the Krishna Eastern Delta Main canal—(Estimate Rs.* 1,13,200).—Expenditure incurred during the year was Rs. — 260 and up to the end of the year was Rs. 93,100. The work was in progress.

(8) *Kistna East Bank Canal Extension Scheme—(Estimate Rs. 28,49,320).*—The total expenditure incurred on this work was Rs. 27,92,691. The work was completed.

(9) *Constructing wharf lascars' quarters and wharf office at Gudivada—(Revised Estimate Rs. 19,600).*—Expenditure incurred during the year was Rs. 1,354 and up to the end of the year was Rs. 19,241. The work was in progress.

(10) *Improvements to Pedalanka drain from head to the undertunnel at Garisapudi—(Estimate Rs. 15·4 lakhs).*—Expenditure incurred during the year was Rs. 2,69,836 and up to the end of the year was Rs. 4,55,594. The work was in progress. Programme for 1949–50, Rs. 4,50,000.

(11) *Irrigation facilities to assessed waste lands in Kalidindi Colonization Scheme—(Estimate Rs. 6,500).*—Expenditure incurred during the year was Rs. 22 and up to the end of the year was Rs. 4,643.

V. **Mopad Reservoir**—*A. Grow More Food works—(1) Rallapad Reddikalva Project (I stage)—(Estimate Rs. 4,08,000).*—Approximate ayacut 2,825 acres. The scheme consists of construction of an anicut across Manneru near Veeraraghavanikota with a channel on the left to feed Mopad and Madavaram tanks. Only preliminary works such as construction of Nissen huts were done during the year under report. The main work will commence during 1949–50. Expenditure incurred during the year was Rs. 10,013 and up to the end of the year was Rs. 10,494. Programme for 1949–50, Rs. 2 lakhs.

(2) *Construction of an anicut across Cheyyar at the head of Uttiramerur tank supply channel—(Estimate Rs. 3,85,000).*—Approximate ayacut 1,000 acres (second crop). The work was almost completed on 31st March 1949. The total expenditure incurred on the scheme was Rs. 4,04,625. Programme for 1949–50, Rs. 20,000.

(3) *Providing irrigation facilities to Yellamanchipad shrotriem—(Estimate Rs. 60,500).*—Approximate ayacut 350 acres. The scheme consists of excavating a new channel for a length of about 5,280 feet with a separate head sluice from the Kanigiri reservoir to irrigate an ayacut of 350 acres of shrotriem lands for raising a late sown short crop from October onwards. The work was started during the year and an expenditure of Rs. 2,000 was incurred. The work is expected to be completed by 1949–50.

B. Other works—Rallapad Reddikalva Project (second stage)—(Estimate Rs. 48,00,400).—This is included in the Postwar Reconstruction Programme. The scheme consists of a reservoir across Manneru about 20 miles below the existing Mopad reservoir with a right side channel and auxiliary works in Kandukur taluk of Nellore district. Only preliminary works were done on this during 1948–49. Expenditure incurred during the year was Rs. 56,865. Programme for 1949–50, Rs. 15 lakhs.

Navigation works—Improvements to Madras wharf at Basin Bridge—(Estimate Rs. 1,89,000).—The work was almost completed except for a small portion for which an expenditure of only Rs. 500 is expected during 1949–50. The expenditure incurred during the year was Rs. 2,276 and up to the end of the year was Rs. 2,22,022.

Works for which capital and revenue accounts are not kept.

A. Grow More Food works—West Godavari district—(1) Restoration of Kalyanarayudu tank—(Estimate Rs. 1,43,000).—Approximate ayacut 470 acres. Expenditure incurred during the year was Rs. 28,944 and up to the end of the year was Rs. 39,041. The work was in progress. Programme for 1949–50, Rs. 60,000.

B. Other works—Visakhapatnam district—(1) Construction of wells in Araku valley—(Estimate Rs. 21,000).—Expenditure incurred during the year was Rs. 6,084 and up to the end of the year was Rs. 16,740. The work was in progress.

(2) *Improvements to No. 2 Pedda tank of Chammachinta—(Revised Estimate Rs. 14,700).*—The work was completed with a total expenditure of Rs. 16,667.

A. Grow More Food works—Anantapur district—Restoration of a Titakal tank—(Estimate Rs. 32,600).—Approximate ayacut 80 acres. The total expenditure on the scheme was Rs. 33,584. The work was completed and land compensation charges were adjusted during the year.

Bellary district—Restoration of Madirikatta tank—(Estimate Rs. 42,000).—Approximate ayacut 55 acres. Expenditure incurred during the year was Rs. 1,071 and up to the end of the year was Rs. 1,141. The work was in progress. Programme for 1949–50, Rs. 47,500.

Kurnool district—(1) *Chinnatekur Project—(Estimate Rs.* 6,20,000).—Approximate ayacut 500 acres. The work was completed in 1947–48 with an expenditure of Rs. 6,37,849. The item of raising the crest of the surplus weir will be done during 1949–50.

(2) *Paleru Reservoir Project—(Estimate Rs.* 4,31,000).—Approximate ayacut 360 acres. The work was completed with a total expenditure of Rs. 4,76,730. The work of raising the body wall of the weir was carried out under a separate estimate and an expenditure of Rs. 3,405 was incurred during the year.

(3) *Restoration of Potharaju tank—(Estimate Rs.* 45,600).—Approximate ayacut 80 acres. The work was started during the year and an expenditure of Rs. 47 only was incurred.

(4) *Reclamation of Lagoon at mile 56/0 of Kurnool–Cuddapah canal (Ravula cheruvu)—(Estimate Rs.* 6,24,492).—Approximate ayacut 700 acres. The work was started during the year and an expenditure of Rs. 1,25,611 was incurred.

(5) *Formation of a tank across the Tigaleru near Eguvacherlapalli village—(Estimate Rs.* 7,29,180).—Approximate ayacut 600 acres. The work was started during the year and an expenditure of Rs. 12,294 was incurred. Programme for 1949–50, Rs. 3,00,000.

(6) *Restoration of Mella tank of Gothipadiya—(Estimate* Rs. 70,906).—Ayacut 300 acres. The work was started during the year and an expenditure of Rs. 38,977 was incurred.

Cuddapah district—Excavating a spring channel to irrigate lands in Gangavaram and Vibrampuram villages—(Estimate Rs. 19,000).—Approximate ayacut 168 acres. Expenditure incurred during the year was Rs. 26 and up to the end of the year was Rs. 14,922. The work was completed.

Chittoor district—Restoration of Yerrikalva in Manchur village—(Revised estimate Rs. 45,700).—Approximate ayacut 30 acres (new) and 51 acres (existing). Expenditure incurred during the year was Rs. 9,442 and up to the end of the year was Rs. 9,450. The work was in progress. Programme for 1949–50, Rs. 20,000.

Nellore district—(1) *Restoration of the Guruvappa cheruvu and excavating a supply channel from Nallavagu (Kandukur taluk, Nellore district)—(Estimate Rs.* 49,750).—Approximate ayacut 150 acres. Expenditure incurred during the year was Rs. 10,002 and up to the end of the year was Rs. 40,021. The work was completed. Only land acquisition charges remain to be paid for which a sum of Rs. 9,750 has been programmed for 1949–50.

(2) *Improvements to Bhimavaram tank—(Estimate Rs.* 97,000).—Approximate ayacut 311 acres. Expenditure incurred during the year was Rs. 31,962 and up to the end of the year was Rs. 72,959. The work was in good progress. Programme for 1949–50, Rs. 25,000.

(3) *Constructing a bed regulator at Pambaleru—(Estimate Rs.* 70,000).—Approximate ayacut 650 acres. Expenditure incurred during the year was nil and up to the end of the year was Rs. 64,464. The work was completed and the channel brought under beneficial use. A sum of Rs. 2,000 has been programmed for 1949–50.

(4) *Formation of a tank at Mogalicherla village—(Estimate Rs.* 1,58,400).—Approximate ayacut 180 acres. Expenditure incurred during the year was

Rs. 441, and up to the end of the year was Rs. 1,09,524. The main work was completed and the sub-work of "Raising the F.T.L. of the tank by 2 feet and constructing a weir" is yet to be completed. Programme for 1949–50, Rs. 10,000.

(5) *Extension of irrigation under Chejerla channel—(Estimate Rs. 46,800)*.—Proposed ayacut 550 acres. Expenditure incurred during the year was Rs. 20,109 and up to the end of the year was Rs. 25,109. The work was in good progress. Programme for 1949–50, Rs. 11,000.

(6) *Restoration of the abandoned tank in Guvvadi village—(Estimate Rs. 27,200)*.—Proposed ayacut 140 acres. The work was started during the year and an expenditure of Rs. 6,996 was incurred. The scheme is expected to be completed in 1949–50. Programme for 1949–50, Rs. 20,000.

(7) *Upputeru scheme (improvements to Sayapeta and Ranabala tanks)-(Estimate Rs. 3,13,800)*.—This scheme is for constructing an anicut across Upputeru, just opposite to the Gudavallur village and taking off a channel above it on the left side to improve supplies to Ranabala and Sayapeta tanks. Proposed ayacut 943 acres. The work was started during the year and an expenditure of Rs. 7,001 was incurred. Programme for 1949–50, Rs. 2 lakhs.

(8) *Forming a new tank across Chowtapalli Vagu near Bhairavaram village in Udayagiri taluk—(Estimate Rs. 1,60,000)*.—The proposal is to form a tank across Chowtapallivagu near Bhairavaram village with a capacity of 43 m. c.ft. Proposed ayacut 450 acres. The work was started during the year and an expenditure of Rs. 56 was incurred.

A. Grow More Food works—Chingleput district—(1) *Constructing a dam across Ninjal Maduvu and excavating a supply channel to the Ponvilanthakalathur tank—(Estimate Rs. 5,34,750)*.—Expenditure incurred during the year was Rs. 5,500 and up to the end of the year was Rs. 4,31,115. The debits raised by the South Indian Railway for construction of culverts were adjusted during the year. The work was completed and the channel brought under beneficial use from 15th November 1945.

(2) *Constructing a masonry retaining wall in Ozhalur river channel in Chingleput taluk of Chingleput district—(Estimate Rs. 59,500)*.—Proposed ayacut 350 acres. The work was started during the year and an expenditure of Rs. 91 was incurred.

B. Other works—Navigation works—(1) *Forming a new flood bank from 5/3 to Kudiraikottalam Nattam—(Estimate Rs. 1,07,500)*.—The work was almost completed and an expenditure of Rs. 8,418 was incurred during the year. The total expenditure incurred up to the end of the year was Rs. 60,194.

(2) *Restoring to standards the west flood bank from 5/3 to 10/2 of North Buckingham canal—(Revised Estimate Rs. 4,29,500)*.—Expenditure incurred during the year was Rs. 47,466 and up to the end of the year was Rs. 2,80,472. The work was in progress and is expected to be completed by 1949–50. Programme for 1949–50, Rs. 1 lakh.

(3) *Extensions and improvements to Araniar left flood bank—(Estimate Rs. 2,03,500)*.—An expenditure of Rs. 105 was incurred during the year towards preliminaries. Programme for 1949–50, Rs. 1,50,000.

(4) *Revetting the slopes of the junction canal between Adyar and Cooum locks—(Estimate Rs. 2·5 lakhs)*.—The second instalment of revetting the junction canal was taken up in 1948–49 as a Post-war Reconstruction work. The total expenditure incurred on this work was Rs. 98,266. Programme for 1949–50. Rs. 1,50,000.

A. Grow More Food works—Tiruchirappalli district—(1) *Restoring the Ponneri tank in Udayarpalayam taluk—(Revised estimate Rs. 6,25,000)*.—Approximate ayacut 1,440 acres. Expenditure incurred during the year was Rs. 7,611 and up to the end of the year was Rs. 4,61,837. The work was completed except for the item of providing irrigation facilities to 25-acre blocks which was nearing completion. Programme for 1949-50, Rs. 500.

Formation of a tank across Uppar Odai in Omandur village (Revised Estimate Rs. 2,91,170).—Approximate ayacut 377 acres. Expenditure incurred during the year was Rs. 310 and up to the end of the year was Rs. 2,62,746. The work was completed in all respects.

(2) *Providing better drainage facilities to wet lands in Thimmarayasamudram village by constructing a syphon across Srirangam Nattuvoikal (Estimate–Rs.* 21,000).—Approximate ayacut 200 acres (second crop). The work was started during the year and an expenditure of Rs. 6,018 was incurred. Programme for 1949-50, Rs. 13,500.

South Arcot district—(1) *Improvements to Anapakkam tank (Estimate Rs.* 17,000).—Approximate ayacut 270 acres. The work was started during the year and an expenditure of Rs. 7,895 was incurred.

(2) *Excavation of a new channel from the right side of Vellar Rajan channel for providing irrigation facilities to Vettarayan thittu and Kilavudinathan villages (Estimate Rs.* 33,000).—Approximate ayacut 472 acres. The work was started during the year and an expenditure of Rs. 5,020 was incurred. Programme for 1949-50, Rs. 21,000.

B. Other works—Improvements to Coleroon North Rajan channel and shifting the head of Khan Sahib canal and Gavarapet channel (Estimate Rs. 57,200).—The work was started during the year and an expenditure of Rs. 10,184 was incurred. Programme for 1949-50, Rs. 23,000.

A. Grow More Food works—Tirunelveli district—Restoration of Sivalaperi tank—(Estimate Rs. 3,90,500).—Approximate ayacut 550 acres. The work was started during the year and an expenditure of Rs. 560 was incurred.

Coimbatore district—Restoration of Kothavadi tank in Pollachi taluk (Estimate Rs. 1,50,000).—Approximate ayacut 295 acres. Expenditure incurred during the year was Rs. 50,143 and up to the end of the year was Rs. 60,444. The work was in progress.

South Kanara district—Constructing an anicut across the Shiriya river in Kasargod taluk (Estimate Rs. 5,23,600).—Approximate ayacut 549 acres. An expenditure of Rs. 49,890 was incurred on the scheme. The work was in progress. Programme for 1949-50, Rs. 3,00,000.

Lower Bhavani Project.—The Lower Bhavani Project designed to irrigate an ayacut of over two lakhs of acres was sanctioned in the year 1947 at an estimated cost of Rs. 7 crores. The following is the brief record of work done on the scheme:—

Headworks.—Land plans and schedule for acquisition of land required for the construction of the dam housing colony at headworks and for formation of roads were prepared during the year. Experimental shafts have been dug at close intervals to the rocky strata below to ascertain the depth to which the earthen dam has to be taken. Trial shafts and cross trenches were excavated to ascertain the nature of rocky strata below the final alignment of the dam was fixed avoiding Talc Schist as far as possible to enable the masonry portion of the dam being founded on reliable solid rock. A coffer dam in the river bed with necessary vents to dispose of the flood water was constructed. Excavation of dam foundations was in progress. Rough stone and face stone required for the work were being quarried at the quarry at M. 9/2 of Satyamangalam-Mettupalayam road and tram line was being laid for the conveyance of the same to the dam site. One Test Sub-division assisted by the Soil Mechanics Officer, Madras, was working in the Project to examine the suitability of the soil for the construction of the earthen dam.

Various types of buildings (both residential and non-residential) were constructed for housing the project offices and staff.

The roads from Satyamangalam-Mettupalayam and from Satyamangalam to Peerkadavu were taken over. All the roads inside the project area including the connection to the Mettupalayam road were formed and the main roads metalled while the others were being maintained as gravel roads. A bridge across the

Bhavani river below the dam site of 12 spans 23′ 3″ wide for transport of materials was under construction.

Water-supply.—Infiltration wells were constructed at the river margin to tap water and a storage reservoir with the necessary filter beds, coagulation tank, etc., were under construction. The pipes and specials for laying the supply and distribution pipes were partly received and laying was commenced.

All the special tools and plant required for the project were indented for and were being received.

Canals system.—For the purpose of investigation of the feasibility of extending the Lower Bhavani Project Main Canal in Dharapuram taluk and to provide irrigation facilities to an extent of about 20,000 acres a Division with two Subdivisions was sanctioned in G.O. Ms. No. 231, P.W., dated 24th January 1948. But owing to the dearth of technical staff the Division could not be formed earlier than the 25th December 1948. However a Subdivision was formed early from April 1948 to do the work of tracing the alignment of the Main Canal on ground commencing from the reservoir and to prepare land plans and schedules for acquiring land required for the Lower Bhavani Project Main Canal. Subsequently sanction was obtained for the addition of two subdivisions to the Canals Division for the purpose of execution of canal works. During the year preparation of plans and schedules was completed and the execution of canal works was attended to. The work of construction of residential and non-residential buildings for housing the offices and staff was in progress. A total expenditure of Rs. 33,82,846 was incurred on the Project up to the end of the year.

Pudukkottai State.—Repair works and anti-erosion works were carried out during the year with an expenditure of Rs. 15,270.

Banganapalle State—Constructing an anicut across Zurreru river and excavation of a channel to a length of 3 *miles.*—This is an incomplete work of the State and an expenditure of Rs. 33,950 was incurred during the year on the scheme. The work was nearing completion.

Restoration of Jolapuram tank.—This is an incomplete major work of the State. An expenditure of Rs. 8,548 was incurred during the year. The work was in progress.

Restoration of Ramatheertham tank.—Total cost of the scheme Rs. 1,10,050. This is also an incomplete work of the State. An expenditure of Rs. 41,183 was incurred on the scheme during the year. The work was in progress.

Chapter V

TUNGABHADRA AND RAMAPADASAGAR PROJECTS.

Tungabhadra Project.

I. Headworks.—The headworks continued to be under the control of Sri A. R. Venkataraman, B.A., B.E., I.S.E., Superintending Engineer, with three Executive Engineers under him. The progress of works is detailed below.

The road from Hospet to the dam site was completed and surfaced with Mexphalt. Three hundred and ninety-seven numbers quarters for the project staff and five hundred and ninety-nine semi-permanent and six hundred and seventy-nine temporary sheds, for labourers were completed. Other buildings completed so far are the hospital, telephone exchange, co-operative stores and godown, market stall, deputy Tahsildar's office and Police station, Radio house and primary schools. Office and Laboratory buildings for the Health Department, the Post Office, a pucca Test house, and building for the recreation club are yet to be taken up. The combined office building was stopped with the ground floor and brought to use.

For the permanent water-supply of the camp, the construction of the Coagulation tank, filter house and clear water reservoir had been completed. One of the two filter plants was erected during the year and the other was nearing completion.

The laying of the supply mains and pipes with house-connections was in progress. The temporary water-supply arrangements continued to be in operation during the year pending completion of the permanent protected water-supply scheme which would be completed in all respects in 1949–50. Proposals costing about Rs. 3 lakhs for the drainage of the entire colony were under finalisation. The Railway Station and quarters for the Railway staff at dam site were completed and the station was opened for traffic from 1st January 1949. The formation of the Railway siding at the dam site and also at Hagari Bommanahalli wherefrom sand is to be brought for the dam construction, were completed.

The excavation of foundations for the dam was continued during the year and a quantity of 7·8 million c.ft. had been done up to the end of March 1949. See photo attached. Fifty holes were drilled in the bed rock for grouting the foundations and sealing the fissures and faults. Of these, 19 were grouted during the year and the others were in progress. Construction materials such as stone, sand, lime and surki were continued to be collected in sufficient quantity to enable pushing through the masonry work for the dam.

On the Hyderabad side, excavation of foundation was in progress. The deep rift in the river bed was being tackled. See photo attached.

There was a set-back in the progress of work from about August 1948, as Hyderabad was pre-occupied with military preparations and their officers evinced little interest in the dam works. Work was resumed on Hyderabad side in December 1948 with matters settling down after the Government of India's Police Action. Work on Madras side was however not affected seriously, but had to be slowed down to enable Hyderabad also to keep pace with Madras. A conference of the representatives of Madras, Hyderabad and the Government of India was held at New Delhi in November 1948 when certain decisions regarding the F.R.L. and use of cement for the spillway, etc., were taken.

The labour strength which was about 6,000 till July 1948 had to be mostly diverted to the canal works during the Hyderabad Police Action, but the strength was later increased and it was about 5,000 at the close of the year. The Special Deputy Collector and his staff attended to the welfare of the labourers at the dam site. For recreation for the labourers a radio receiving set with loud speakers at the different labour camps, was provided. Recreation grounds were also arranged for. Rations at 16 ozs. per head were arranged to be procured and distributed regularly.

The Health Staff under the immediate direction of the Special Health Officer continued to be in charge of the health and sanitation in the Headworks Camp. Regular anti-malarial operations were continued and the incidence of malaria in the camp was small. Epidemics such as plague, cholera and smallpox which were prevalent in Hospet, were averted from spreading into the Headworks Camp by the timely vigilance and the inoculation campaign by the Health Staff in the camp area.

Almost all essential machinery required for the headworks had been received. The machinery and pumps at the dam site were mostly being worked by electricity. Two numbers 170 K.W. diesel generating sets and two 25 K.W. sets had been installed to supply power for operating the machinery for lighting the camp area, for domestic consumption and for flood lighting the works during night shifts.

The investigation of the roads in the submergible area was undertaken and proposals for diverting them above the foreshore were being made. A special subdivision was formed for this work.

Twenty-seven accidents occurred during the year out of which six were fatal. Payment of compensation for the victims had been arranged for.

II. Canals.—The Canals Circle was in charge of Sri N. Padmanabha Iyer, B.A., B.E., I.S.E., Superintending Engineer, up to 9th February 1949, when Sri K. V. Ekambaram, B.E., I.S.E., took over. The four executive divisions continued throughout the year. A fifth division was formed on 26th January 1949 for the experimental localization of the two distributaries (Tsallakudlur and Sugur).

(*a*) *Power Canal.*—Excavation from mileage 5/4 to 8/4 (including rock cutting from 6/0 to 7/0, 7/7 to 8/1 + 550′ and 8/3 to 8/4) was in progress. In the reach 6/0 to 7/0 excavation was being taken up by machinery. The alignment of the Power Canal below mile 12/0 could not be finalised owing to the Archaeological department's objections in locating the works in and near Hampi. The Committee appointed by the Government of India to settle the question examined three alternative sites and has since given its decision. The alignment of the canal below 12/0 will now be taken up.

(*b*) *Low Level Canal.*—Excavation of the canal in a length of 6 miles in Hospet Division and 62 miles in Adoni Division had been completed. Work in several other reaches was in various stages of progress. Earthwork between 79/5 to 80/2 in the Hagari Division was mostly being done by machines such as excavators and scrapers. Scrapers hauled by tractors were found to be economical and expeditious in the formation of embankments. See photo of completed Canal sections attached.

As regards masonry works, 31 bridges and 25 U.Ts. had been completed and 37 U.Ts. and 19 bridges were in progress. More than half of the work on the regulator at 79/0 and the escape at 78/5 + 380 had been completed during the year. In the Hagari Aqueduct about three-fourths of the sub-structure work had been completed and the balance was in good progress. The contract for superstructure work was being concluded. A metalled road connecting Sirivaram quarry (wherefrom metal for the Hagari aqueduct is to be transported) and Bellary-Moka Road and a gravelled road from Bellary-Moka Road to Bhairadevanahalli camp were formed. A tram line about 6½ miles in length was laid from Bhairadevanahalli to Sirivaram for transport of quarry materials to the Hagari aqueduct work.

Two numbers 3/4 cyd. P and H excavators were received and put on work on the embankment near the Hagari aqueduct. Excavators indented for from abroad (i.e., 2 numbers 1½ cyds. P and H, 1 number Marion 2½ cyds. and 2 numbers Lima 3 cyds.) were being received.

The activities in the main canal at present extend to mile 175. Work below mile 175 (i.e., for a length of 35 miles) including the detailed investigation of the Canal in this reach, will be taken up when the present work had progressed well and staff could be released for the lower reaches.

In order to gather sufficient data for localizing the ayacut according to the cropping scheme approved by Government, two distributaries, Tsallakudlur and Sugur, have been taken up experimentally. For this purpose, levels were being taken in the areas served by the distributaries and after drawing contours, and fixing the commanded area the delimitation of the ayacut under each kind of crop such as wet, dry, perennial and garden will be done.

The staff colonies at Amaravathi, Venkatapuram, Korugodu, Sirivaram, Bhairadevanahalli, Chintakunta, etc., were occupied. Electrification of the Bhairadevanahalli camp was in progress. For the Public Works Department colony at Adoni, water was supplied from the Municipal main. In other colonies chlorinated supply was arranged for.

About 20,000 labourers had to be recruited from outside districts (Visakhapatnam, Vijayavada, Coimbatore, etc.), for departmental execution. Suitable camps with water-supply arrangements were constructed at the various work sites. The labourers were well looked after. Special arrangements were made for procurement and supply of rations to the labour at 16 oz. per head. With the amenities provided, the labourers seem to be satisfied and in a mood to stick on. A Jail camp was opened at Rayapuram and the canal excavation work in the reach miles 56 to 62 of the Low Level Canal entrusted to the Jail department for execution by employing convict labourers.

The health in the camps (both departmental and contractors) throughout the canal was satisfactorily maintained with the aid of health and medical staff appointed for the canals area. Cholera broke out in epidemic form during June

and July in the contractors' camp in Adoni Division. On the whole there were 54 cases of attacks of which 27 proved to be fatal. Prompt action by the Health department staff prevented its spreading further.

All the subdivision and division headquarters along the canals were interconnected by telephone lines. There is connection to the dam site also.

During the year there were 14 cases of accidents out of which 6 proved fatal and necessary action was taken to compensate the victims.

Programme of work to be done during 1949–50.

Tungabhadra Project—I. Headworks.—The excavation of dam foundations will be completed in all respects. Masonry work for the dam will be in progress both on Madras and Hyderabad sides. Until the water level in the river goes down sufficiently low, i.e., till about 15th December 1949, the dam masonry construction will be confined to the portion lying on both sides of the deep river course. Necessary coffer-dams in the river bed have already been constructed, and the work in the river bed portion will be resumed after about 15th December 1949. About 20 per cent of the total masonry work involved for the dam construction is expected to be completed during this year.

II. Canals.—Finalisation of alignment below 12/0 of Power Canal and up to 11/7 of the Low Level Canal will be attended to. Detailed investigation of the several distributaries will be taken up after the experimental localisation under Tsallakudlur and Sugur distributaries is completed. Considerable progress is expected to be made in regard to the excavation of canals already aligned and in progress. Thirty aqueducts and under-tunnels and 28 bridges, in which works are now in progress will be completed. Thirty-five more aqueducts and under tunnels and 8 bridges will be taken up for execution. In the Hagari aqueduct the substructure work will be completed and the superstructure work taken up and 40 per cent completed.

Ramapadasagar Project.

The detailed investigation of the project was continued during the year. Since there was not much work to be done the Ramapadasagar Circle formed in October 1946 was closed down by March 1949. Two divisions were also closed down. Only one division is being continued in 1949–50 to finalise the exploratory works in progress and to arrange for the closing down of the investigation work. Sri K. V. Ekambaram, B.E., I.S.E., continued to be the Superintending Engineer in charge of the investigation till 7th February 1949 when the circle was abolished. The following investigation was in progress during the year under review :—

(*a*) *Dam site investigation.*—Borings suggested by Dr. Terzaghi at 10 points in order to ascertain the nature of material lying between the bottom of the clay stratum and the rock below were completed. A second set of borings was done at the site of the subsidiary dam to study the properties of the clay overburden on which the subsidiary dam is to rest. For further examination of the bed rock in the river bed at the dam site, two new holes were drilled 50 feet into the bed rock and cores extracted as suggested by the Geologist. In the region about 1,800 feet down stream of the present dam line, high rock level was indicated and to have confirmation, borings at six (6) points were in progress. The total number of holes put in during the year was 112 and the depth bored 8,344 feet out of which 243 feet were in rock.

Pumping experiments to provide data to estimate the seepage in the area of the cofferdam were conducted at two points P2 and P5 in 1948. The tests were repeated at P2 in 1949 season and the data were being analysed.

Daily soundings at specified points to study the scour at various stages of the river were continued to be taken during the flood season of 1948 also. Float observations were made in high floods to study the velocity and direction of current, at various points. In order to have sufficient data on the silt carried by

the Godavari samples of the water were taken daily and analysed for suspended sediments. In the Soil Mechanics Laboratory at Polavaram 3,290 water samples were tested for suspended sediment.

M. Mayer, Inspector-General of Mines and Works, France, was invited to inspect the site and advise if the bed sand at the dam site could be impermeabilised with clay injections so that the seepage into the cofferdam area for the dam construction could be minimised. On his suggestion, arrangements were in progress for conducting field experiments on impermeabilising the sand by injecting chemically treated clay solution.

(*b*) *Canal investigation.*—The full length of the left main canal was investigated and the final alignment decided and laid out on ground. The canal will be about 130 miles long and will irrigate an area of 4·66 lakhs of acres for 1st crop and 3·10 lakhs of acres for 2nd crop.

The right main canal will be about 89 miles long and is expected to irrigate above 7·20 lakhs of acres for 1st crop and 9·00 lakhs of acres for 2nd crop including the second crop proposed in the Krishna delta. The alignment and investigation of this canal is proposed to be taken up after the project is sanctioned for execution. However, with a view to finalise the camp layout at the dam site through which this canal will pass so as to enable construction of the camp immediately the project is sanctioned, the alignment of the canal in the head reach for a length of 14 miles was investigated in detail. The floods of the Godavari in this year were of low order, the highest level being + 77·02 at dam site, on 30th September 1948. The corresponding discharge as measured at Dowlaishwaram anicut was 656,740 cusecs.

The Honourable Minister for Public Works visited the dam site and the Reservoir area in November 1948.

(*c*) *Programme of work to be done during* 1949–50.—There is now only one division for this project investigation. This is to be abolished by 30th September 1949, as the investigation contemplated will be over by then. Thereafter there will be only one subdivision to look to the closing down of the works and accounts and for disposal of the plant and machinery.

The programme of work for 1949–50 thus comprises finalisation of the items already taken up, and closing down the investigation work. Gauge readings and silt and scour observations will, however, be continued throughout the 1949 flood season.

ANNEXURE TO ADMINISTRATION REPORT, 1948–49.

Expenditure, 1948–49.

Minor heads of appropriation.

I. Tungabhadra Project—

	Grant.	*Outlay.*
	RS.	RS.
68. e. Works	1,77,08,300	1,68,67,954
68. f. A. Establishment	10,60,900	10,55,381
B. Pension Charges	82,500	Awaited from Accountant-General.
Tools and Plant	95,900	1,08,463
Suspense	— 7,08,100	— 14,39,492
Receipts and Recoveries on Capital Account	— 35,100	— 21,116

(Figures except under e. Works are those of Superintending Engineers in their 3/49 statements. The figures have not yet been finalised.)

II. "18" Irrigation—Project Surveys—Ramapadasagar—

f. Other Charges	6,88,800	6,23,125
Suspense	— 3,40,900	+ 3,90,523
d. Establishment	7,46,800	6,63,320

Note.—Final figures are not yet available.

Chapter VI.

A. Season, Rainfall and Supply.

Godavari Delta System.—In the Western delta water-supply was almost sufficient in the first crop season in most parts but there was some competition for water during second crop season due to unauthorized irrigation and taking water for 'C' schedule lands beyond 15th March 1949 on a large scale and consequently the date of closing of the Godavari Western delta canals had to be postponed to 12th May 1949 so as to fill in all the drinking-water and seed-bed tanks. In the Central delta supply conditions were unfavourable during first crop season and rains were late. As a result, transplantation was delayed in certain districts. But the crop was fair during the year. Water-supply for the second crop was made available in time. But in some localities seedlings were not adequate as certain seed-beds were damaged by insects. The yield in second crop was fair. In the Eastern delta water-supply was satisfactory during first crop season and transplantation was done without complaints. Water-supply was good in the beginning of second crop season. The total area thrown open for second crop was 72,428 acres including additional area of 9,633 acres.

Chicacole Minor Rivers System.—Water regulation was carried out on turn system as usual. No difficulty was experienced in working the system. During the month of September 1948 there was no sufficient flow of water in Bhyri channel and on the representation of the ryots Koramboo work had to be done at the head of Bhyri channel resulting in copious flow and there was no agitation afterwards for water.

Nagavalli River System.—The main channel was opened for the first crop on 15th June 1948. The rainfall was evenly distributed during the crop period and the crop was satisfactory. There was enough water in the main channel to meet the demands of early transplantation and this was supplemented by water from the project-fed tanks. The crops were satisfactory and there were no heavy floods during the year.

Krishna Delta System.—Freshes in the river Krishna arrived on 3rd June 1948. Transplantation was commenced in the second week of June 1948. The Krishna Eastern Delta Main Canal was opened on 15th May 1948. Due to normal supply of water in the river, transplantation could not be commenced earlier than the second week of June. Transplantation was in good progress due to heavy rains which supplemented the regular water-supply and it was completed in August 1948.

Ceded Districts.—In Bellary and Anantapur districts the rainfall was fairly normal and timely and the production of dry crops was generally satisfactory throughout. In the Kurnool district there was not sufficient rainfall in the beginning of the south-west monsoon. In the Cuddapah and Chittoor districts, the seasonal conditions were generally favourable.

Pennar River Canals System.—The average rainfall in the Sangam delta was 22·29″ against 19·00″ of the previous year. The maximum water level in the Nellore tank was 16·3′ on 29th November 1948 against 15·4′ on 29th October 1947. The maximum water levels in the Survepalli and Kanigiri reservoirs were 10·05′ and 21′ against the F.T.L. 10′ and 21·45′ respectively.

The rainfall in the upper catchment of Pennar and in the Nellore district during the year was poor and the river flow was scanty during the transplantation period. Conditions improved in the middle of September 1948 with the moderate and frequent rainfall and the reservoirs and tanks got nearly filled up enabling the entire ayacut being cultivated. The yield was satisfactory. Permission was given for raising second crop to an extent of 8,000 acres under Kanigiri reservoir, 2,000 acres under Survepalli reservoir and 2,000 acres under Nellore tank.

Cauvery Delta System and Cauvery-Mettur Project.—The Mettur reservoir was

The level steadily rose from June 1948 and began to fall gradually till January 1949 and fell to 48·35 on 24th February 1949 when it was closed for irrigation. Though supplies from Mettur reservoir were satisfactory, the scarcity of rainfall in the irrigated area during the irrigation season in succession produced rather unhealthy condition of crops in some areas particularly towards the end of the High Level channel. There was a period of anxiety in October and special efforts were taken by adopting a system of turns in High Level channel, Uyyacondan channel and Perumalai channel to ensure adequate supplies to the crops.

Willingdon Reservoir and the Toludur Project.—The reservoir did not attain its full level in the year as the monsoon was a failure. In the post-transplantation period there was dearth of supply. However the late rains in November helped to tide over the crisis.

Periyar System.—The Periyar lake was opened for irrigation on the usual date of opening, viz., 1st June 1948 when the lake level was at 135·65. The lake was closed on 10th March 1949 when the level was at 127·75. In order to meet the requirements without difficulty and to maintain command levels when there was a decrease in demand as a whole, turn system was introduced from 5th to 28th February 1949.

The average rainfall during the year was 96·59 inches in the Periyar lake catchment against 78·77 inches in the previous year. The monsoon was moderate in the lake catchment. The rainfall in Periyar delta and Cumbum valley was much less than the average. Though there was not adequate rainfall both in the Periyar delta and Cumbum valley particularly in the north-east monsoon period, crops were successfully harvested, as there was judicious and careful regulation of supply.

B. Closure of Canals.

Godavari delta.

Name of canal.	Date of closure.	Date of opening.
Godavari Eastern Delta Canals	9th May 1948	5th June 1948.
Godavari Western Delta Main Canals, etc.	9th May 1949, 6 a.m.	1st June 1948, 6 p.m.
Godavari Central Delta	20th April 1948, 6 p.m.	20th May 1948, 6 p.m.

Krishna delta.

Eastern delta—		
Main Canal	15th April 1948	1st June 1948.
Ryves Canal	1st April 1948	1st June 1948.
Bandar Canal	15th April 1948	1st June 1948.
Ellore Canal	1st April 1948	1st June 1948.
East Bank Canal	1st April 1948	1st June 1948.
Western delta—		
Main Canal	15th March 1948	1st June 1948.
Commamur Canal	15th March 1948	1st June 1948.
Nizampatam Canal	1st April 1948	1st June 1948.
West Bank Canal	15th March 1948	1st June 1948.

Chapter VII.

Projects under Consideration.

Of the schemes which were under investigation last year, fifteen were sanctioned during the year; the most important of them were: Malampuzha Project in Malabar district, Pennar-Kumudavathi Project in Anantapur district, Mettur

Canals Scheme in Salem district, provision of irrigation facilities to Peddapalli and Allur blocks in Guntur district, restoration of the Sivalaperi tank in Tirunelveli district and provision of irrigation facilities to Peddapatnam and Narayanapatnam block in Krishna district, etc. Proposals in respect of Pullambadi Scheme, the Kattalai High Level Channel Extension Scheme and the Atleru Project were pending with the Government.

The progress of investigation in respect of the other schemes mentioned in the previous year's report as also new investigations undertaken during the year are given below :—

East Godavari district.

(1) *The scheme for constructing a lock and regulator across the Coringa river.*—Plans and estimate were pending sanction of Government.

West Godavari district.

(2) *Kanur Scheme.*—Approximate ayacut 2,348 acres. Plans and estimate were pending sanction of Government.

(3) *Extension of irrigation under Annacoderu Channel.*—Approximate ayacut 975 acres. Proposals were under examination in the Chief Engineer's (Irrigation) office.

Visakhapatnam district.

(4) *Construction of a dam across the Sarugudugedda in Vedurupalli village designed to irrigate an ayacut of* 232 *acres new and* 18 *acres existing.*—Detailed plans and estimate were administratively approved by Government but kept in abeyance pending decision on the Thandava Reservoir Scheme.

(5) *Construction of Polipalli anicut across Gostani river in Vizianagram Estate to provide irrigation facilities to* 1,100 *acres.*—Proposals were sent to Government for sanction.

(6) *Paidigam Project.*—Approximate ayacut 3,500 acres. Preliminary investigation of the scheme was in progress.

(7) *Providing irrigation facilities to the lands in Araku valley by utilizing the waters of the hill stream Jildavagu.*—Individual schemes in the Araku valley were reported to be not worth taking up. Still further investigation of the scheme was in progress.

(8) *Vamsadhara Project.*—Approximate ayacut 225,000 acres. Proposals for detailed investigation of the scheme were sent up to the Government for sanction.

(9) *Nagavalli anicut at Narayanapuram.*—Approximate ayacut 850 acres. Proposals for detailed investigation of the scheme were sent up to the Government for approval.

(10) *Gummidigedda Reservoir Project.*—Approximate ayacut 3,000 acres. Proposals for detailed investigation of the scheme were sent up to Government for approval.

(11) *Janjhavathi Reservoir Project.*—Approximate ayacut 29,000 acres. Preliminary investigation of the scheme was completed. Plans and estimate were under examination in the Chief Engineer's (Irrigation) office.

(12) *Improvements to Sekharapalli Channel.*—The scheme was under examination in the Chief Engineer's (Irrigation) office.

(13) *Tuni or Thandava Reservoir Project.*—Detailed investigation of the scheme was proposed.

(14) *Kothakota Reservoir Project or Kalyanapuram Lova.*—Approximate ayacut 1,200 acres. Preliminary investigation of the scheme was completed and proposals were under examination in the Chief Engineer's (Irrigation) office.

(15) *Pakalapadu or Ravanapalli Reservoir Project across Upper Varaha River.*—Approximate ayacut 1,656 acres. Preliminary investigation of the scheme was completed and report of the Superintending Engineer was awaited.

(16) *Gadigamma Reservoir Project near Krishnadevipeta.*—Preliminary investigation of the scheme was completed and report awaited from the Superintending Engineer.

(17) *Vegavathi Reservoir Project.*—An estimate for Rs. 10,20,500 was received from the Superintending Engineer and a preliminary report was sent to Government.

(18) *Improvements to and extension of Nagarikatakam channel.*—Approximate ayacut 4,833 acres. Preliminary investigation was completed but the scheme was ordered to be deferred.

Krishna district.

(19) The alternative proposal for providing irrigation facilities to Vaivaka and Korukollu villages was ordered to be considered.

(20) *Providing irrigation facilities to 460 acres in Ayodhya, etc., villages in Divi taluk by extending XI/4 Peddakallapalli south branch channel.*—An estimate for Rs. 18,000 was sanctioned but work was not started pending realization of contribution of ryots.

(21) *Providing irrigation facilities to about 960 acres in Majeru, Lankapalli, etc., villages.*—An estimate for Rs. 51,150 was sanctioned by Government.

Guntur district.

(22) *Improvements to Repalle drain, Bhattiprolu drain and the Tungabhadra drain.*—The scheme was under investigation.

(23) *Providing irrigation facilities to 6,420 acres of dry lands in Peddapalli and Allur villages of Repalle and Bapatla taluks (Peddapalli block).*—An estimate for Rs. 5,74,000 was sanctioned by Government.

(24) *Gundalakamma Project.*—Detailed estimates were under examination in the Chief Engineer's (Irrigation) office.

(25) *Providing irrigation facilities to Buddalapalem Block.*—Ayacut 1,100 acres. An estimate for Rs. 1,79,480 was sanctioned by Government.

(26) *Chigurukota and Mandavalli Block.*—Approximate ayacut 863 acres. An estimate for Rs. 40,000 was sanctioned but contribution not yet realized.

(27) *Gantasala Block.*—The scheme was ordered to be dropped.

(28) *Chilakalapudy Block under Bandar canal.*—An estimate for Rs. 67,000 has since been sanctioned by Government.

Anantapur district.

(29) *Pennar-Kumudavathi Project.*—An estimate for Rs. 19·6 lakhs was sanctioned by Government. An area of about 3,000 acres will be benefited by this scheme.

(30) *Upper Pennar Project.*—An estimate for Rs. 90 lakhs was pending sanction of Government. This scheme will irrigate an area of 6,000 acres.

(31) *Restoring the breached Kotha tank to a lower F.T.L. across Thallapillavanka in Peddanavaripalli.*—Plans and estimate were received from the Superintending Engineer and scrutinised in the Chief Engineer's office. Submission of estimates to Government was delayed for want of soil analysis particulars from the Soil Mechanics officer.

(32) *Bhairavanithippa Project.*—Plans and estimates were under scrutiny in the Chief Engineer's Office.

(33) *Restoring the Marutla tank and improving the supplies to Lakkavaram.*—Detailed investigation of the scheme was proposed.

(34) *Pilliguntla tank.*—It was decided that this scheme should wait till the Bhairavanitippa scheme was finally settled.

(35) *Mid-Pennar Project.*—The scheme was taken up for detailed investigation.

(36) *Gantimarri tank.*—Orders of Government on the estimates submitted already were awaited.

(37) *Illur tank.*—Investigation of the scheme was completed and plans and estimate were awaited from the Superintending Engineer.

(38) *Dorigallu Project.*—The scheme was under investigation.

(39) *Ramagiri tank.*—Plans and estimate were under preparation in the Superintending Engineer's office.

Chittoor district.

(40) *Kalyani River Scheme.*—Orders were issued that the anicut proposals need not be considered and a reservoir scheme be investigated. This was under investigation.

(41) *Bhimanadhi Reservoir Scheme.*—Investigation of the scheme was completed and plans and estimate were under scrutiny in the Chief Engineer's (Irrigation) office.

(42) *Potlavanka Scheme.*—The scheme was not considered to be worthwhile taking up.

Kurnool district.

(43) *The scheme for reclamation of lagoons along the Kurnool-Cuddapah canal.*—Estimate for the lagoon at 56/0 was sanctioned and the other two lagoons at 59/0 and 60/0 were ordered to be kept under abeyance pending the execution of works connected with the reclamation of the lagoon at 56/0.

(44) *Restoring the Dogirayadu tank across Peddavanka.*—A preliminary report on the scheme was received from the Superintending Engineer.

(45) *Forming a new tank across Kollimagulavagu.*—The scheme was sanctioned by Government.

Cuddapah district.

(46) *Mekalakunta Eru Scheme.*—Results of gauge readings were awaited from the Superintending Engineer.

(47) *Lower Sagileru Project.*—Gauge readings were conducted and Geological survey was completed. The Superintending Engineer's report on the above aspect was awaited.

(48) *Restoration of Dharbavari Agraharam tank.*—Plans and estimate for the scheme were awaited from the Executive Engineer.

(49) *Formation of a new tank across Goderu near Thippareddipalli.*—The scheme was under investigation.

(50) *Formation of a tank across Vanneswaram vanka.*—Detailed investigation of the scheme was completed and soil analysis particulars were awaited from the Physics and Soil Mechanics Officer.

(51) *Gandikota Project.*—An alternative site at Mylavaram was being investigated.

(52) *Chilamkur tank.*—The scheme was ordered to be dropped.

(53) *Kammavaripalli tank.*—The scheme was under investigation.

(54) *Pullampeta Project (four alternative schemes).*—A report about the proposal to have two small reservoirs one across Bahuda and the other across Pinchanadi received from the Superintending Engineer was under consideration by the Chief Engineer for Irrigation.

(55) *Vontimitta tank and its supply channel (two alternative schemes).*—The scheme was ordered to be dropped.

(56) *Restoring the Marathi Cheruvu.*—Plans and estimate were under scrutiny in the Chief Engineer's (Irrigation) office.

Bellary district.

(57) *Benical tank.*—The scheme was under investigation.

(58) *Hagari-Bommanahalli Project.*—Investigation of the scheme was completed and preliminary report from the Superintending Engineer was awaited.

Nellore district.

(59) *Atleru Project.*—Plans and estimates submitted to Government were pending sanction.

(60) *Construction of a reservoir across the Kauverivagu.*—Plans and estimate were awaited from the Superintending Engineer.

(61) *Providing irrigation facilities for Chouthaputhedu, etc., villages under Pyderu, Sangam Delta, by excavating a separate contour channel above the existing Pyderu channel.*—Investigation of the scheme was completed and plans and estimate were awaited from the Superintending Engineer.

(62) *Extension of irrigation under Virur spring channel, Atmakur taluk, by providing irrigation facilities in S.R. Nos. 132, etc., of Suryapalem village under Virur spring channel.*—A temporary pipe was fixed for the benefit of the ayacut proposed to be reclaimed and brought under wet cultivation. The Board of Revenue gave instructions to watch the working of the pipe and send a report at the end of fasli 1357. This period was extended to two more years.

(63) *Anicut across Manneru at the head of Karedu tank supply channel.*—Investigation of the scheme was completed and plans and estimate were sent to Government for sanction.

(64) *Improvements to Kanigiri tank.*—Plans and estimate were sent to Government for sanction.

(65) *Excavating a supply channel from Paleru to Bitragunta, etc., tanks.*—Plans and estimates were being revised by the Superintending Engineer.

(66) *Forming a new tank at Nandipad.*—Investigation of the scheme was completed and plans and estimate were sent to Government for sanction.

(67) *Restoration of the supply channel from Beeraperu and improvements to the Gundipad tank.*—Investigation of the scheme was completed and plans and estimate were sent to Government for sanction.

(68) *Improvements to the Kaniyampad tank, Udayagiri taluk.*—Investigation of the scheme was completed. The proposal is for raising the F.T.L. of the tank by 2 feet. Plans and estimate were sent to Government for sanction.

(69) *Raising the F.T.L. of Survepalli Reservoir.*—Investigation of the scheme was completed. The proposals are for increasing the storage capacity of the reservoir by raising the F.T.L. by 2 feet.

(70) *Fitting up falling shutters over the Kota Anicut and improving supply to the Yerur tank.*—Investigation of the scheme was completed and plans and estimate were under scrutiny in the Chief Engineer's (Irrigation) office.

(71) *Kandaleru Scheme.*—The diverting of the supplies from Pambaleru by constructing a regulator at the head of Vatteru is being looked into and the Collector of Nellore has been asked to take up the question of providing regulating arrangements to the Pidur head sluice in the Kandaleru river with the Raja of Venkatagiri.

(72) *Improving the supply to Hajipuram tank.*—Investigation of the scheme was completed and plans and estimate submitted by the Executive Engineer were under scrutiny in the Chief Engineer's (Irrigation) office.

(73) *Reclamation of Allur swamp.*—Investigation of the scheme was completed and plans and estimate were under scrutiny with the Executive Engineer, Nellore Division.

(74) *Improvements to the Vasili tank.*—The proposals were under scrutiny with the Executive Engineer, Nellore Division.

(75) *Constructing an anicut across Chippaleru and improving supply to* (1) *Tallapalem and* (2) *Zadalanki tanks.*—Investigation of the scheme was completed.

(76) *Improving the supply of North Amalur tank.*—Investigation of the scheme was completed.

Chingleput district.

(77) *Restoration of the old flood banks on either side of the Araniar river below the Railway bridge at Ponneri.*—An estimate for Rs. 3,25,530 was sanctioned by Government.

(78) *Construction of anicuts and forming a reservoir across the Araniar to improve irrigation facilities in Ponneri.*—An estimate for Rs. 95·5 lakhs was submitted to Government for sanction.

(79) *Improvements to Krishnapuram river channel.*—Plans and estimate for Rs. 10,110 were approved by the Chief Engineer (Irrigation) and returned to the Superintending Engineer for execution.

(80) *Constructing an anicut across Chavali stream.*—Plans and estimate were under scrutiny in the Chief Engineer's (Irrigation) office.

South Arcot district.

(81) *Thambipettai Odai Project.*—Proposed ayacut 299 acres. An estimate for Rs. 1,44,403 has since been sanctioned by Government.

(82) *Reclamation of the Kaliveli Swamp Scheme.*—Proposed ayacut 1,000 acres. An estimate for Rs. 3,75,817 has since been sanctioned by Government.

(83) *Construction of an anicut across the South Pennar in Sathanur limits in Tiruvannamalai taluk.*—The Scheme was under investigation.

(84) *Construction of an anicut across the Ponniar near Ellis Choultry.*—Proposed ayacut 16,210 acres (existing). An estimate for Rs. 14·84 lakhs was sanctioned by Government.

Tanjore district.

(85) *Providing irrigation facilities to lands in Muthakurichi village.*—The scheme was ordered to be deferred.

(86) *Improvements to Narasinga Cauvery Upper reaches.*—Proposed ayacut 5,639 acres (existing); 422 acres (new). An estimate for Rs. 23,440 was sanctioned by Government.

(87) *Providing irrigation facilities to Ambalapattu village.*—The scheme was ordered to be dropped.

(88) *Providing irrigation facilities to lands in Poyyundankudikadu village.*—The scheme was ordered to be deferred.

Mathurai district.

(89) *Vaigai Reservoir Project.*—Detailed investigation of the project was completed by a Special Subdivision. It is proposed to impound the surplus water flowing down the river Vaigai during floods for irrigating an area of 1,000 acres in Nilakkottai taluk and 11,000 acres in Tirumangalam and 5,000 acres of Periyar hard cases.

Ramnad district.

(90) *Watrap Reservoir.*—Gaugings were conducted and availability of supply was being observed.

Tirunelveli district.

(91) *Reservoir across Ramanadhi.*—Preliminary investigation of the scheme was made by the Executive Engineer, Special Division, Tiruchirappalli. The

approximate cost of the scheme for a reservoir of 360 million cubic feet capacity with provision for irrigating a new area of 650 acres in addition to safeguarding existing irrigation works, works out to Rs. 119·5 lakhs. The anticipated return on the scheme is 0·049 per cent.

(92) *Manimuthar Reservoir.*—Detailed investigation of the scheme was completed by a Special Subdivision. A reservoir of 5,250 million cubic feet capacity in the first stage has been proposed with a new channel on the right side of the river for a length of about 18 miles to serve a new area of 10,000 acres.

(93) *Constructing an anicut across Vaippar.*—Plans and estimates called for from the Superintending Engineer were awaited.

(94) *Restoration of Vayali Malayadipatti tanks.*—A special Supervisor was posted for the detailed investigation of the scheme.

Tiruchirappalli district.

(95) *Construction of a reservoir across Kodaganar.*—The Superintending Engineer, Tiruchirappalli Circle, submitted a preliminary report with approximate estimate amounting to Rs. 32 lakhs for the scheme. The proposal was for extending new ayacut to the extent of 3,000 acres and to give steady supplies to the ayacut under the Amaravathi channels. The preliminary report was under exmamination.

(96) *Forming a Reservoir in Eraiyur village.*—Gaugings in Chinnar for forming the above reservoir were continued in 1948–49 also. An estimate for Rs. 22·6 lakhs (works only) was under scrutiny in the Chief Engineer's (Irrigation) office.

Coimbatore district.

(97) *Thattahalla Project.*—Proposals for an alternative scheme were awaited from the Superintending Engineer.

(98) *Doddahalla Project.*—Plans and estimates were under scrutiny in the Chief Engineer's (Irrigation) office.

(99) *Amaravathy Project.*—Plans and estimates were under scrutiny in the Chief Engineer's (Irrigation) office.

(100) *Palayam channel.*—Proposals were awaited from the Superintending Engineer.

(101) *Aliyar River Project.*—Proposals were awaited from the Superintending Engineer.

(102) *Chikkarasampalayam Scheme.*—The scheme was ordered to be kept under abeyance due to dearth of technical staff.

(103) *Manakkadavu Reservoir Scheme.*—Gauge readings of the Shanmuganadhi were continued to be observed.

(104) *Remodelling of Aliyar and Amaravathi channels.*—Proposals for resluicing open cuts were under preparation by the Special Supervisors.

(105) *Extension of Ariyapuram channel in Pollachi taluk.*—Proposals submitted by the Superintending Engineer were returned to him with remarks.

(106) *Improvements to Siruvanai Dam.*—Proposals were pending approval of Government.

Salem district.

(107) *Excavation of right bank and left bank canals from Mettur Reservoir.*—Proposed ayacut 45,000 acres. An estimate for Rs. 2·34 crores was sanctioned by Government.

(108) *Chinnar Reservoir.*—Proposals were awaited from the Superintending Engineer.

(109) *Thoppiar Project.*—Detailed investigation was in progress.

(110) *Badathalav Project.*—Plans and estimates were sanctioned by Government and the work is in progress.

(111) *Excavating a distributary known as Mevani distributary from Kugalur Branch channel.*—Approximate ayacut 263 acres. The work is in progress.

Malabar district.

(112) *Malampuzha Project in Palghat taluk.*—An estimate for Rs. 4·16 crores was sanctioned by Government, and work just started.

(113) *Charamangalam Anicut across Gayatri river.*—An estimate for Rs. 9,40,000 was sanctioned by Government and work is in progress.

(114) *Vandithodu Anicut Scheme in Palghat taluk.*—Ayacut to be benefited 270 acres (existing); 147 acres (new). An estimate for Rs. 92,075 was sanctioned by Government, and work is in progress.

(115) *Restoration of Ayinicad Dam.*—Plans and estimates were sent to Government for sanction.

(116) *Kundichira Dam.*—Plans and estimates were submitted to Government for sanction.

(117) *Walayar Reservoir Scheme in Palghat taluk.*—Plans and estimates were sent to Government for sanction.

(118) *Mangalam River Reservoir Scheme in Palghat taluk.*—Plans and estimates were under scrutiny in the Chief Engineer's (Irrigation) office.

(119) *Meenakarai Reservoir Scheme in Palghat taluk.*—Detailed investigation of the scheme was completed and plans and estimate were awaited from the Superintending Engineer.

(120) *Kanhirapuzha Reservoir Scheme in Walluvanad taluk.*—Investigation of the scheme was completed and plans and estimates are under scrutiny in Chief Engineer's office.

South Kanara district.

(121) *Kumbla Reclamation Scheme.*—Proposals were awaited from the Superintending Engineer.

(122) *Gurupur Anicut Scheme.*—The scheme was under investigation.

KISTNA-PENNAR PROJECT.

The following is the brief record of work done on the investigation of the Project.

Detailed surveys of the river Krishna extending to about half a mile upstream and downstream of the proposed dam site (both in Madras and Hyderabad limits) were completed. Reservoir waterspread surveys in Madras limits covering an area of 107 square miles were completed. Calyx Drill holes were put. Records of hydrological data were being collected systematically. Air photographs of the Krishna dam site and waterspread area were being taken. Survey work connected with Mittakondala ridge and Krishna-Pennar canal were done. The East Side High Level Canal was aligned for the entire length of 107 miles and necessary field particulars were collected. Field work on the west side channel about 100 miles long was completed. River site surveys of the Mylavaram Dam and the Cuddapah north and south canals were almost completed and penetrometer soundings of the river being taken and correlated by a few hand borings.

Detailed surveys of the river Pennar for about a mile in length covering the whole gorge area at the proposed dam site were completed. Calyx Drill holes were put. Exploratory work by way of extensive penetrometer probings, correlated by hand borings were done and favourable line for the dam was selected.

Field work was completed in respect of waterspread surveys. Some data regarding testing of materials, gauging operations, etc., were collected. Air photographs of the Pennar dam and waterspread areas were taken. Planimetric and ground control surveys of the dam site were completed as also supplemental control of heighting work for waterspread area. Out of a total length of about 343 miles in the South Main Canal from Pennar Reservoir, the canal has been aligned for 80 miles and necessary surveys done.

Grow More Food schemes.—Several major schemes taken up for execution last year were carried on to completion or were in an advanced stage of execution during the year. Forty-two new schemes at an approximate cost of Rs. 103·64 lakhs to irrigate an approximate ayacut of about 35,000 acres (inclusive of ensuring better irrigation facilities) were sanctioned during the year—vide list appended.

The Government of India have recently revised their orders regarding grant of subsidy to Grow More Food Schemes according to which an unremunerative Grow More Food Scheme will be eligible for a subsidy from Government of India on the basis of 50 per cent net outlay only without any particular relation to the additional production anticipated by the execution of such schemes.

Post-War Reconstruction Schemes.—The schemes for improvement of drainage in Krishna and Cauvery Deltas were under different stages of execution. The scheme of Perumal Tank Surplus arrangements was completed. These schemes will not only relieve drainage difficulties but also bring under irrigation an extent of 16,500 acres yielding about 9,800 tons of foodgrains. The total expenditure incurred on these schemes was about Rs. 53·70 lakhs against an estimated cost of Rs. 46·95 lakhs.

Kudimaramath works.—The policy of Government in respect of kudimaramath works was continued to be in force during the year under review also in so far as channels that were not shown the concession during 1946–47 and 1947–48. About 196 channels at an estimated cost of Rs. 4,01,126 were taken up during the year 1948–49.

Contour-bunding.—Proposals for providing contour-bunding for about 5,000 acres near Guntakkal were pending with Government awaiting the passing of the proposed bill on contour-bunding into law. The methods adopted in Bombay were being examined to find out if a comparison of the figures of the rates for contour-bunding in Bombay with those in Madras is possible.

Gaugings.—A Division with headquarters at Madras was formed on 13th December 1948 and the existing Cauvery Gauging Subdivision at Mysore was attached to it. The period from the date of formation of the Division was part of the slack season when no gauging operations were in progress. Joint gaugings (by Mysore and Madras) of Sivasamudram and Shimsha Power channels to be done every three years, were attended to in the month of March. Re-rating of meters to be used for the first-crop season, was done as in the previous year at the rating station at Krishnarajasagara. Scrutiny of gaugings done during the last irrigation season, all over the Province was in progress. Preparation of statements of monthly discharges at Srivaikuntam Anicut—Thambraparni basin with rainfall figures, etc., was attended to.

RESEARCH.

During the year 1948–49 the Irrigation Research Station, Poondi, made further progress in all activities, both at Madras in the Soil Engineering Laboratory and at Poondi in the Hydraulic Section.

Improvements were effected to the Laboratory building and connected works. New buildings were constructed for the Division Office, store, etc. A large number of hydraulic models were constructed and experiments carried out on them. Investigations were made on various problems connected with improvement of existing irrigation works and design of new works. Also studies were made under building research. The studies yielded valuable results. They invariably

led to the clarification of various complicated factors in the designs tested and to the improvement of the designs, cost of construction and/or of subsequent maintenance were appreciably reduced. To cite some examples—(1) A new design of stilling basin for overflow dams evolved at the station was found extremely efficient and comparatively cheap. (ii) The final choice of the design for Tungabhadra Project was materially influenced by the experiments carried out at Poondi. The reduction in cost thereby effected was estimated at about Rs. 13 lakhs. (iii) A number of existing sluices were remodelled at small cost on lines suggested by model tests in order to increase the discharge drawn through them. By this means considerable extension of irrigated area could be effected. In one case the necessity for constructing a costly supplemental sluice was avoided and a saving of Rs. 2 lakhs effected. (iv) Studies made on models of the Ramapadasagar excavation pit and on the Lower Bhavani earth dam were indeed very instructive in clarifying several factors of vital importance from technical and economic points of view.

Many new instruments and other items of equipment were added to the Soil Engineering Laboratory at Madras.

Among the important pieces of equipment, the following may be mentioned, i.e., a nuffle furnace, a distilled water plant, an epidiascope, etc.

Soil surveys for the Vaigai Reservoir Project and Manimuthar Project were carried out during the year.

Tests on soils were carried out for the Lower Bhavani Project, Krishna-Pennar Project, Vaigai and other Irrigation Projects, sediment load analysis on the waters of Krishna and Pennar rivers and Mettur Reservoir was performed. Seepage studies on Lower Bhavani and Ramapadasagar Projects were completed. The properties of vermiculite and its use as building material were being investigated in the Laboratory. A series of experiments was performed on the Laboratory and the pilot plant scales to devise an economic and efficient method for purifying the water supplied to the Madras City. The large scale experiments were conducted at the Government Experimental Filter Station, Kilpauk.

The Laboratory provided training for a number of Engineers and Scientists in Soil Mechanics and Testing Procedure.

The Research Station at Poondi and the Soil Engineering Laboratory, Madras, took part in the All-India Swadeshi and Industrial Exhibition organized at Madras by the Tamilnad Congress Committee.

The Research Station had during the year many distinguished visitors. Special mention may be made of the Institution of Engineers (India), the Crops and Soil Wings of the Board of Agriculture, Mr. Arthur Morgan (Tennessee Valley Authority), the Director, Central Waterways, Irrigation and Navigation Research Station, Poona, and the Hon'ble Ministers and Chief Engineers of the Mysore Government. Remarks of some of the distinguished visitors are extracted in Appendix.

Central Designs Office.

During the year the following items of work were attended to by the Central Designs Office, Madras :—

(1) Clay injection experiments and studies regarding the feasibility of its application to cofferdam works in Ramapadasagar Dam. In this connection the well-known French Engineer Expert Mr. Mayer visited the office in December 1948 and gave advice for the experiments and studies.

(2) Preliminary studies for the selection of a favourable alignment for dam for the Pennar Dam in Kistna-Pennar Project. The field data so far available were made use of and suggestions given to the field staff for further exploration of foundation rock and check on the site now tentatively seen as favourable.

(3) Detailed designs and preparation of plans for the Headworks of Lower Bhavani Project were taken up.

(4) Preliminary designs and working drawings were taken up for Malampuzha Project.

(5) Studies of uplift pressures in dams and weirs with cut off using the relaxation methods, newly developed by Professor R. V. Southwell in England were completed and the results compared with those obtained by Lanes, Blights and Khosla's theories expanded.

Almost all the apparatus intended for the concrete Laboratory from abroad have been received and they are being put into use. The erection of a shed for the Workshops was in progress.

The Holdens Photo Copying Machine and the Photo Elastic apparatus were fitted up and put into working condition.

The following experiments were conducted during the year :—

(1) Tests on sand, cement aggregate for clay injection experiments for Ramapadasagar Dam.

(2) Effect of admixtures on concrete.

(3) Flake tests.

(4) Effect of burrowing animals on earth dams.

(5) Compression and tension tests on about 5,000 specimens received from Hagari aqueduct, Tungabhadra and other places.

(6) Standardisation of sand.

(7) Tensile stress experiments on bottlenuts and welded rods received from Hagari about 150 Nos.

(8) Culvert pipes reinforced with old asphalt drums received from Highways Department tested for bending.

(9) Testing of slabs made of cheap materials received from the Electricity Department.

(10) Testing of Hollow Cement Blocks.

(11) Petrological examination of rocks in Polavaram abutment area.

The Concrete Laboratory had many distinguished visitors, the prominent among them were : Mr. Mayer, French Engineer, Members of the World Bank Commission, Dr. J. L. Savage, Consulting Engineer, Ministers from Mysore State Messrs. K. T. Bashyam and M. Siddayya and Major-General Williams, Engineer-in-Chief, Indian Army.

Floods, Breaches and Accidents.

Godavari Delta.—The maximum flood level over the crest of the Dowlaishwaram Anicut during 1948–49 was 8·2′ on 31st August 1948 against 12·5′ on 5th July 1947. During the year there were no floods worth mentioning.

Krishna Delta.—Due to heavy floods in Budameru drain, a number of breaches occurred on Ellore Canal and some of its branches which were closed under special breach-closing estimates.

Tanjore district.—A breach occurred on 2nd September 1948 in the Vetticad embankment in the Cauvery Delta and the breach was closed at an estimated cost of Rs. 53,000. There was a breach in the Grand Anicut Extension channel at R.D. 1/04 on 2nd August 1948 which was also closed immediately.

APPENDIX.

LIST OF SCHEMES SANCTIONED UNDER "GROW MORE FOOD" CAMPAIGN DURING THE YEAR 1948-49.

Serial number.	Name.	Cost.	Area benefited.
		RS.	ACS.
1.	Provision of irrigation facilities to the waste lands at the tail end of Cholangi and Goripudi channels, Kakinada taluk, East Godavari district (G.O. Ms. No. 1164, P.W., dated 6th April 1948).	22,000	445
2.	Provision of irrigation facilities to Peddapalli and Alur Blocks, Repalli and Bapatla taluks, Guntur district (G.O. Ms. No. 1238, P.W., dated 12th April 1948).	8,30,000	5,587
3.	Improvements to Anapakkam tank by raising its F.T.L. by 2 feet lying above the Kaliveli swamp, Tindivanam taluk, South Arcot district (G.O. Ms. No. 1381, P.W., dated 21st April 1948).	12,000	270
4.	Formation of a tank across the Tigaleru near Eguvacherlapalli village, Markapur taluk, Kurnool district (G.O. Ms. No. 1641, P.W., dated 7th May 1948).	7,29,180	600
5.	Restoration of Kothakalva channel, Tadpatri taluk, Anantapur district (G.O. No. 1182, Revenue, dated 15th May 1948 and G.O. Ms. No. 2955, P.W., dated 11th December 1948).	79,232	120
6.	Excavation of a supply channel to Sithakadu and Kadakadappai villages, Tanjore taluk, Tanjore district (G.O. Ms. No. 2112, P.W., dated 9th June 1948).	49,300	355
7.	Provision of irrigation facilities to the Kollipara block, Tenali taluk, Guntur district (G.O. Ms. No. 2222, P.W., dated 17th June 1948).	2,06,050	1,409
8.	Providing better drainage facilities to the belt in Thimmarayasamudram village by constructing a syphon across Srirangam Nattu Voikal and excavating a drainage channel, Tiruchirappalli taluk and district (G.O. Ms. No. 2196, P.W., dated 17th June 1948).	27,344	200 (II crop)
9.	Excavation of a new channel from the right side of Ve lar Rajan channel for providing irrigation facilities to certain dry lands in Vettarayan Thittu and Kilavadinatham villages, Chidambaram taluk, South Arcot district (G.O. Ms. No. 2290, P.W., dated 25th June 1948).	39,146	472
10.	Improvements to Kiliyanur tank, Tindivanam taluk, South Arcot district (G.O. Ms. No. 2760, P.W., dated 31st July 1948).	63,803	200
11.	Providing irrigation facilities to a block of 440 acres of precarious wet lands under Ponukumada channel, Gudivada taluk, Krishna district (G.O. Ms. No. 2980, P.W., dated 18th August 1948).	25,340	440
12.	Provision of irrigation facilities to Bandar West Block, Bandar taluk, Krishna district (G.O. Ms. No. 3675, P.W., dated 10th September 1948).	74,610	1,039
3.	Provision of irrigation facilities to Majeru Lankapalli block, Divi taluk, Krishna district (G.O. Ms. No. 3804, P.W., dated 20th September 1948).	58,970	966
14.	Restoration of Sivalaperi tank, Tirunelveli district (G.O. Ms. No. 3834, P.W., dated 22nd September 1948).	4,81,750	275
15.	Improvements to Vandithodu anicut and channel, Palghat taluk, Malabar district (G.O. Ms. No. 4054, P.W., dated 16th October 1948).	92,075	270 (existing) 147 (new)
16.	Provision of irrigation facilities to Peddapatnam and Narayanapatnam block, Bandar taluk, Krishna district (G.O. Ms. No. 4116, P.W., dated 20th October 1948).	4,02,782	2,722
17.	Construction of bed dams and clubbing of ayacuts in the Kattalai south bank cannal, Tiruchirappalli district (G.O. Ms. No. 4188, P.W., dated 26th October 1948).	53,180	..
18.	Extension of irrigation in Yellamanchipad shrotriyam villages (Kanigiri Reservoir), Kovur taluk, Nellore district (G.O. Ms. No. 4298, P.W., dated 3rd November 1948).	71,615	350

Serial number.	Name.	Cost.	Area benefited.
		RS.	ACS.
19	Provision of a new tank across Choutapalli vagu, Udayagiri taluk, Nellore district (G.O. Ms. No. 4491, P.W., dated 22nd November 1948).	2,76,045	450
20	Extension of Veeravalli channel, Gannavaram taluk, Krishna district (G.O. Ms. No. 4554, P.W., dated 25th November 1948).	64,300	982
21	Construction of an anicut across Gayatripuzha near Charamangalam and excavation of channel therefrom, Palghat taluk, Malabar district (G.O. Ms. No. 4555, P.W., dated 25th November 1948).	9,40,000	1,874
22	Provision of irrigation facilities to Undrajavaram and other villages, Tanuku taluk, West Godavari district (G.O. Ms. No. 4613, P.W., dated 29th November 1948).	46,490	580 (wet) 451 (garden crop)
23	Bhavanasi tank—Development of irrigation under the tank by raising the F.T.L. by 9 ft., Ongole taluk, Guntur district (G.O. Ms. No. 4857, P.W., dated 11th December 1948).	39,063	100
24	Improvements to Narasinga Cauvery Upper reach, Tanjore district (G.O. Ms. No. 4835, P.W., dated 10th December 1948).	23,440	422 (I crop) 467 (II crop)
25	Restoration of Potharaju tank, Sirvel taluk, Kurnool district (G.O. Ms. No. 4858, dated 11th December 1948).	45,600	80
26	Construction of an anicut on Markandanathi and excavation of a channel to Badathalav, Krishnagiri taluk, Salem district (G.O. Ms. No. 4854, dated 11th December 1948).	10,40,000	(407 (I crop 300 (II crop)
27	Excavating a subsidiary drain to the Polraj drain from Gudivada to Chintalapudi (G.O. Ms. No. 4855, P.W., dated 11th December 1948).	49,596	1,900 (existing)
28	Providing direct source of supply to Kattar from Kamalapuram channel sanctioned by Chief Engineer's (Irrigation) No. 9628/48 M.E.P., dated 17th December 1948.	15,000	835 (existing) 30 (II crop)
29	Restoration of Koneri tank (Toludur Anicut System), Vriddachalam taluk, South Arcot district (Chief Engineer's (Irrigation) No. 5617/49-B-19, dated 19th January 1949).	10,600	603 (existing)
30	Pennar-Kumuthavathi Project, Hindupur taluk, Anantapur district (G.O. Ms. No. 375, P.W., dated 3rd February 1949).	19,60,000	3,130
31	Construction of a masonry retaining wall in the Ozhalur river channel, Chingleput taluk and district (G.O. Ms. No. 399, P.W., dated 4th February 1949).	77,475	350 (existing)
32	Restoration of Perur tank of Boyadagumpala village, Markapur taluk, Kurnool district (G.O. Ms. No. 914, P.W., dated 12th March 1949).	59,400	106
33	Construction of a reservoir across the Kollimagulavagu near Paniem, Nandyal taluk, Kurnool district (G.O. Ms. No. 915, P.W., dated 12th March 1949).	10,06,000	700
34	Restoration of Ramanaidupalli tank supply channel and the anicut across Boggeru river at the head of the supply channel, Udayagiri taluk, Nellore district (G.O. Ms. No. 913, P.W., dated 12th March 1949).	3,57,360	274
35	Improvements to Kolladinne and Tummalapenta tanks by excavating a supply channel from Munganur tank supply channel, Kavali taluk, Nellore district (G.O. Ms. No. 912, P.W., dated 12th March 1949).	2,19,150	900
36	Improvements and repairs to Kunjimangalam tank, Tindivanam taluk, South Arcot district (G.O. Ms. No. 910, P.W., dated 12th March 1949).	1,18,398	244
37	Provision of irrigation facilities to Buddalapalem and Kakarlamudi villages, Bandar taluk, Krishna district (G.O. Ms. No. 916, P.W., dated 12th March 1949).	1,97,150	1,110
38	Provision of irrigation facilities to land colonization block in Yetimoga village and formation of a flood bank from the block, Divi taluk, Krishna district (G.O. Ms. No. 917, P.W., dated 12th March 1949).	1,36,370	773

Serial number.	Name.	Cost.	Area benefited.
		RS.	ACS.
39	Provision of irrigation facilities to Bhavadevarapalli block, Divi taluk, Krishna district (G.O. Ms. No. 920, P.W., dated 12th March 1949).	1,42,660	1,182
40	Provision of irrigation facilities to lands in Pedaganjam and Kanparthi villages by excavating a new channel from M. 90/1 of the R.B. of Kommamur canal above the Peddaganjam block, Ongole taluk, Guntur district (G.O. Ms. No. 918, P.W., dated 12th March 1949).	90,270	600
41	Restoration of Grandhivani tank of Machavaram village, Vijayavada taluk, Krishna district (G.O. Ms. No. 919, P.W., dated 12th March 1949).	91,150	150
42	Improvements to Chandramadaga tank, Udipi taluk, South Kanara district (G.O. Ms. No. 1145, P.W., dated 27th March 1949).	39,761	243 (II crop)
	Total ..	1,03,63,656	35,110

MADRAS,
20th September 1949.

A. R. VENKATACHARI,
Chief Engineer for Irrigation.

IRRIGATION RESEARCH STATION, POONDI.

IMPRESSIONS OF THE VISITORS.

(1)

The President and Members of the Crops and Soil Wing of the Board of Agriculture in India paid a visit to the place through the kind arrangements made by Mr. Shivaraman, Director of Agriculture, Madras, on the 8th April 1948. We have had the most interesting and instructive round the works and laboratories.

DATAR SING,
V.C.I.C.A.R. and President.

8th April 1948.

(2)

I am very grateful to the Station Staff for showing me round their very interesting laboratory installations, which visit I enjoyed very much.

V. S. ANAND,
Superintending Engineer, Bombay Electric Grid.

9th June 1948.

(3)

We saw some very useful and interesting work being carried out at the Irrigation Research Station, Poondi. This station will serve the Peninsular India where canal irrigation and Hydro-Electric power is badly needed. We wish you the best of luck in your pioneer effort in the South.

D. G. GANDHY,
A. S. SEN,
Officers on Special duty, Ministry of Agriculture (Soil Conservation), Government of India, New Delhi.

7th July 1948.

(4)

This Satyamurthi Reservoir and Research Station constitute a creditable achievement of the people of Madras. The Research Station particularly is of great importance to the whole of India and I wish it increasing success and usefulness to the country.

K. T. BASHYAM,
H. SIDDAIYYA,
Hon'ble Ministers, Mysore State.

30*th July* 1948.

(5)

The demonstration you gave me of your Research Station is very interesting. I get the impression of careful and competent planning.

ARTHUR E. MORGAN,
Tennessee Valley Authority.

30*th December* 1948.

(6)

I was very pleased to see through the Research Station which appeared to me carefully planned. A lot of very interesting experiments are going on, which will serve as a guide for the great constructive works on South Indian rivers. The results will be awaited with interest by the whole country.

MEGHNAD SATRA,
Professor of Physics, Calcutta University.

30*th December* 1948.

(7)

The party of students and staff from Alagappa Chettiar College of Technology, University of Madras, feel thankful for the detailed explanations given of the various very interesting investigations in progress in this Irrigation Research Station. A very pleasant and instructive time was spent here, and we feel sure these investigations will lead to practical results of very great value to the country. It will be useful if some select investigations carried out in this Institute are published regularly in Scientific and Engineering Journals of International standing and circulation.

M. A. GOVINDAN,
Managing Director.

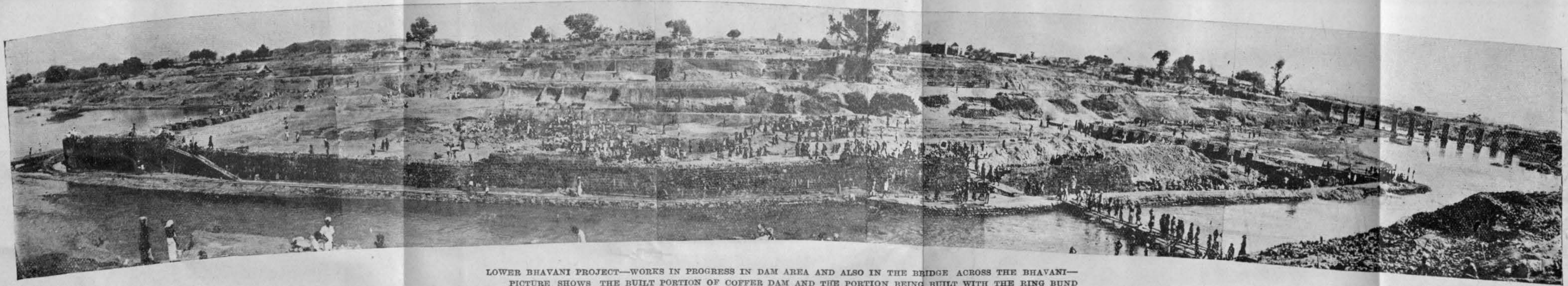
5*th February* 1949.

(8)

I was very much impressed with the hydraulic research being carried out at Poondi and am sure the station will grow and expand its activities with more problems to be tackled in connection with various projects. I am thankful to Dr. Rao, Mr. Kuttiammu and the staff for showing me round.

D. V. JOGLEKHAR,
Director, Central Waterways Irrigation and Navigation Research Station, Poona.

9*th March* 1949.

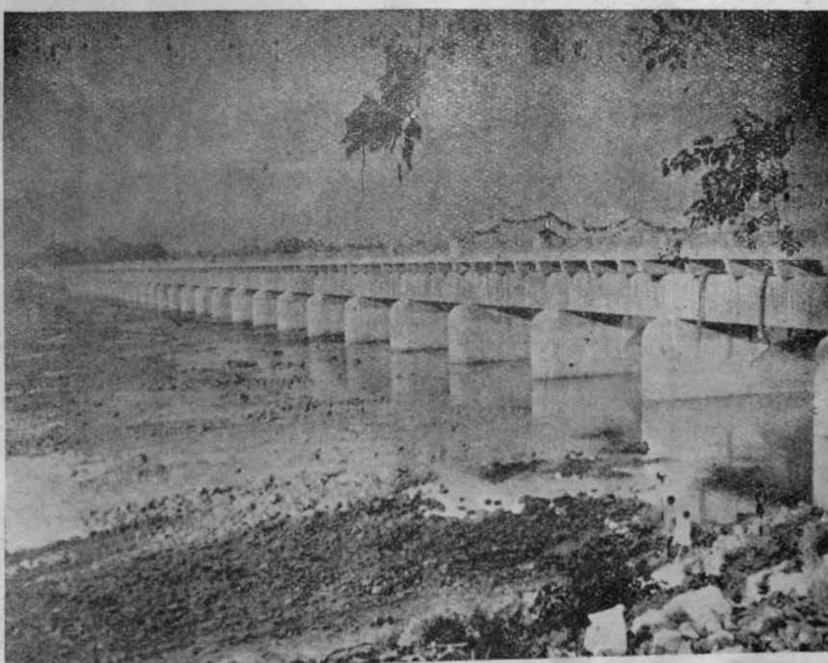


LOWER BHAVANI PROJECT—WORKS IN PROGRESS IN DAM AREA AND ALSO IN THE BRIDGE ACROSS THE BHAVANI—PICTURE SHOWS THE BUILT PORTION OF COFFER DAM AND THE PORTION BEING BUILT WITH THE RING BUND ARRANGEMENTS. EXCAVATION ON THE LEFT FLANK IS ALSO SEEN IN THE PICTURE.

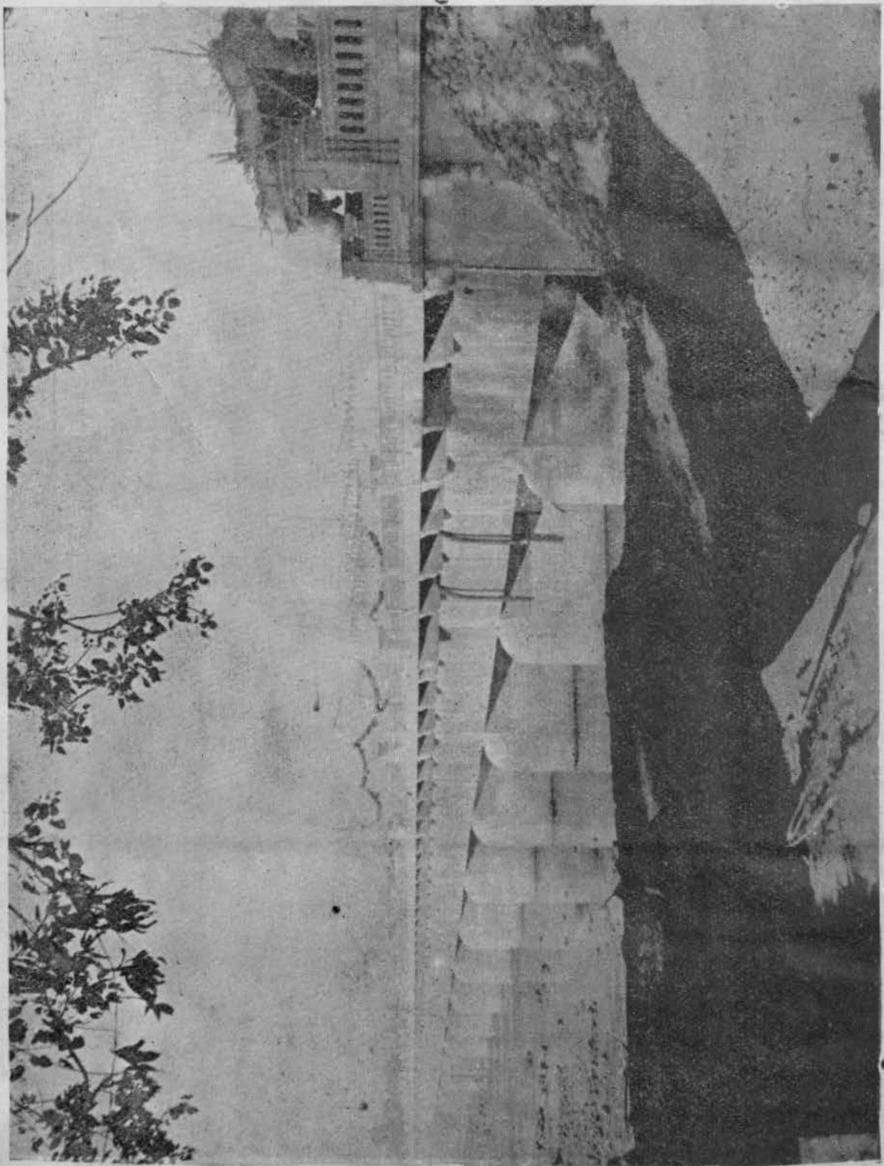
4



GANNAVARAM AQUEDUCT



GANNAVARAM AQUEDUCT

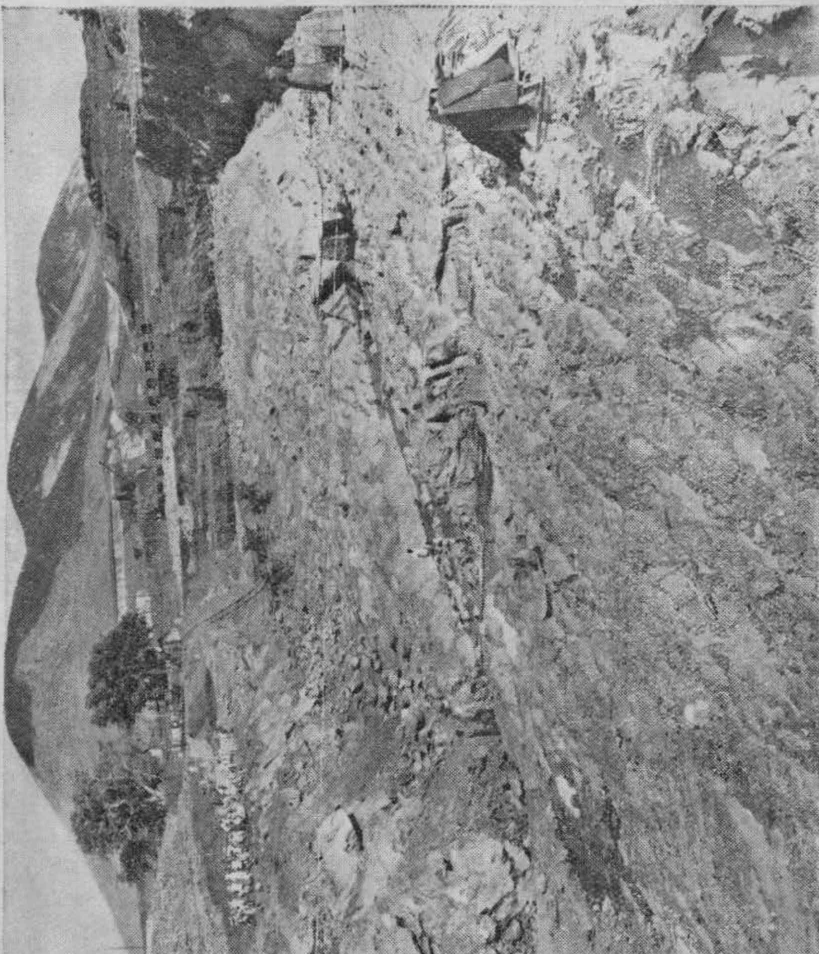




PODALADA LOCK AT 34/4 OF GANNAVARAM CANAL.



PODALADA LOCK AT 34/4 OF GANNAVARAM CANAL.



TUNGABHADRA PROJECT—FOUNDATION TRENCH BETWEEN RAYA CHANNEL AT THE RIVER MARGIN—
NOTE THE TUGGER HOIST IN ACTION.



TUNGABHADRA PROJECT—EXCAVATED REACH—
LOW LEVEL CANAL 75/4.

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